

EXECUTIVE SUMMARY

Marc Pryor

INTRODUCTION

This Preliminary Staff Assessment (PSA) contains the Energy Commission staff's draft independent analysis and recommendations on the Potrero Power Plant Unit 7 Project (Unit 7), a nominal 540-Megawatt (MW), electrical power generation facility. Sometime after a 30-day public comment period, staff will issue its testimony in the form of the Final Staff Assessment (FSA).

Neither the PSA nor the FSA are decision documents for these proceedings. They do not, and will not, contain findings of the Energy Commission related to either environmental impacts or the project's compliance with local/state/federal legal requirements. The California Energy Commission will make the final decision, including findings, after completion of evidentiary hearings. During the Committee's evidentiary hearings, they will consider the recommendations presented by Energy Commission staff; the applicant; and the intervenors¹, before making a final decision on Mirant Potrero, LLC's (Mirant) application to construct and operate the Unit 7 project. In addition, the Committee will consider comments provided by member of the public; and local, state, and federal agencies.

It is the responsibility of the Energy Commission staff to complete an independent assessment of the project's potential effects on the environment, the public's health and safety, and whether the project conforms with all applicable laws, ordinances, regulations and standards (LORS). The staff also recommends measures to mitigate potential significant adverse environmental effects and conditions for construction, operation and eventual closure of the project, if approved by the Energy Commission. The analyses contained in this document were prepared in accordance with Public Resources Code Sections 25500 et seq.; the California Code of Regulations, Title 20, Sections 12001 et seq.; and the California Environmental Quality Act (Pub. Resources Code §§ 21000 et seq.) and its guidelines (Cal. Code Regs., tit. 14 §§ 15000 et seq.).

The Unit 7 project, including related facilities such as the electric transmission lines, water supply lines and wastewater lines, are under the Energy Commission's jurisdiction (Pub. Resources Code § 25500). When issuing a license, the Energy Commission acts as lead state agency (Pub. Resource Code § 25519(c)) under the California Environmental Quality Act (Pub. Resource Code §§ 21000 et seq.), and its process is functionally equivalent to the preparation of an environmental impact report (Cal. Code Regs., tit. 14 § 15251(k)).

¹ The intervenors are: City and County of San Francisco (CCSF), Southeast Alliance for Environmental Justice (SAEJ), CALifornians for Renewable Energy, Inc. (CARE), Our Children's Earth Foundation (OCE), Potrero Boosters Neighborhood Association (PBNA), Communities for a Better Environmentt (CBE), and Dogpatch Neighborhood Association (DNA).

PROJECT LOCATION AND DESCRIPTION

On May 31, 2000, the applicant, Southern Energy Potrero, LLC (SEP) (as of February 7, 2001, Mirant Potrero, LLC or Mirant), filed an Application for Certification (AFC) with the California Energy Commission. Mirant is seeking certification from the Energy Commission to construct and operate the Potrero Power Plant Unit 7 Project, a nominal 540-MW, natural gas-fired, combined cycle electric generation facility. On October 11, 2000, the California Energy Commission accepted the AFC as complete. On January 19, January 31, and April 20, 2001, Mirant filed amendments to its original proposal in response to input from the City and County of San Francisco (CCSF) and the public. Additional information was provided in response to information requests through May 16, 2001.

Mirant estimates the capital costs of the Unit 7 project to be \$260 to \$320 million. The applicant expects to employ a peak construction workforce of about 287 in the 14th month of construction, and a permanent workforce of 10 for plant operation. Construction payroll is estimated to be from \$50 to \$70 million, while annual operations payroll is expected to be \$1 to 1.5 million, including benefits.

If certified, construction of the Unit 7 project, from site preparation to commercial operation is expected to take approximately 24 months from the date of certification, or soon thereafter.

PUBLIC AGENCY COORDINATION

Publicly noticed workshops and/or teleconferences were held on the following topics: air quality, biological resources, cultural resources, environmental justice, geology and paleontology, noise, power plant reliability, power plant efficiency, project siting alternatives, socioeconomics, soil and water resources, traffic and transportation, transmission system engineering, visual resources, and waste management. Five workshops were held in San Francisco, and two aquatic biology teleconferences were held in Sacramento prior to the completion of the Preliminary Staff Assessment (PSA).

Several of the workshops and teleconferences were attended by local, state and federal agencies including, but not limited to: CCSF, Bay Area Air Quality Management District (BAAQMD), California Department of Fish and Game (CDFG), and National Marine Fisheries Service (NMFS). These workshops and teleconferences have been held by staff to understand the issues and concerns of the public, intervenors, agencies, and the applicant. Many helpful comments were received during these events.

In addition to these workshops and teleconferences, extensive coordination has occurred with the numerous local, state and federal agencies that have an interest in the project. Energy Commission staff has worked with the California Independent System Operator (Cal-ISO), California Air Resources Board, U.S. Environmental Protection Agency, San Francisco Bay Regional Water Quality Control Board and California Department of Fish and others to identify and resolve issues of concern.

Written comments on this PSA will be taken into consideration in staff's following analysis, the Final Staff Assessment (FSA), where appropriate.

SAN FRANCISCO ORDINANCE OF MAY 23, 2001

The Board of Supervisors of the City and County of San Francisco provided a copy of an ordinance that had its first reading on May 21, 2001, that addresses the new generation at the Potrero Power Plant. A second reading was performed on May 29, 2001, and the ordinance was adopted and signed by the Mayor. The Ordinance will be effective 30 days after adoption and signing.

Energy Commission staff was provided a copy of the ordinance on May 23, 2001, but due to the short time period involved, has not had the opportunity to study the ordinance and incorporate it into its analyses. However, staff will consider the ordinance when preparing the FSA.

STAFF'S CONCLUSIONS

Each technical area in the PSA includes a discussion of the project and the existing environmental setting; the project's conformance with laws, ordinances, regulations and standards (LORS) and whether the facility can be constructed and operated safely and reliably; project specific and cumulative impacts. The environmental consequences of the project using the proposed mitigation measures; conclusions and recommendations; and any proposed conditions of certification under which the project should be constructed and operated.

If the Energy Commission decides to approve the project, staff has proposed conditions of certification to ensure that the facility is constructed and operated in a safe and reliable manner and potential impacts are mitigated to the greatest extent feasible.

ISSUES REMAINING

For the following outstanding issues to be resolved, additional information will need to be provided by the applicant, and further staff analysis must be done.

Staff is expecting that the necessary additional information will be provided by Mirant prior to the FSA, preferably prior to the PSA workshops to ensure full discussion of the issues at the workshops.

AIR QUALITY

The analysis contained in the Preliminary Determination of Compliance (PDOC) issued by the BAAQMD has been incorporated into the PSA. BAAQMD believes that the project complies with the appropriate rules and requirements of the District and will not contribute to the degradation of the air quality in the San Francisco Bay Area Air Quality Management District.

Energy Commission staff has identified a number of local air quality issues and potentially significant impacts beyond those addressed by the San Francisco Bay Area Air Quality Management District permit. To mitigate these potential impacts, staff has proposed additional conditions of certification for PM-10 air quality offsets and local (San Francisco) diesel-powered vehicles including, but not limited to, school buses.

WASTE MANAGEMENT

Staff cannot determine at this time whether construction of the offshore diffusers will result in significant impacts until additional information pertaining to the nature and extent of contaminated sediment is analyzed. Also, staff is not able to conclude that construction of the diffusers will comply with all applicable agency requirements.

SOIL AND WATER RESOURCES

THERMAL IMPACTS

At this time, insufficient details are provided to allow an evaluation of the diffusers performance relative to the California Thermal Plan. The required information includes 1) details of the diffuser design (port number, spacing, diameter and orientation) and 2) a characterization of the thermal plume in terms of plots of temperature rise isotherms at different times in the tide cycle.

BEST TECHNOLOGY AVAILABLE – COOLING WATER INTAKE

It is concluded that from the standpoint of water supply the addition of Unit 7 may have significant impacts in the area of water supply unless proper mitigation is performed regarding the design of the circulating water intake structure. Therefore, until the applicant has performed a complete evaluation of alternative designs for the intake, Staff can not make conclusions or recommendations related to the impacts of the circulating water system. This evaluation is necessary before completion of the FSA.

WATER SUPPLY / WASTEWATER DISCHARGE

For the areas of water supply and waste discharge, the applicant has indicated that they will be in compliance with all applicable LORS and permit requirements related to Water Resources. The applicant had not filed for a National Pollution Discharge Elimination System (NPDES) permit with the San Francisco Regional Water Quality Control Board (SFRWQCB) until May 17, 2001, and a copy was not docketed with the Energy Commission until May 21.

Without a final NPDES permit, staff is unable at this time to determine that the project will comply with all applicable laws, ordinances, regulations and standards. A determination will be made in the FSA. Staff will also continue to evaluate the use of wastewater effluent for the Unit 7 project between now and the FSA.

EROSION AND SEDIMENTATION / STORMWATER

Staff cannot make a determination that the proposed Unit 7 project will not result in any significant adverse impacts to soil resources until the following items are addressed:

- The development of a complete erosion and sedimentation control plan that incorporates staff's proposed mitigation measures.
- An Updated Spill Prevention Control and Countermeasure Plan.
- A NPDES permit for Stormwater Discharges Associated with Construction Activities.
- Sizes, lengths, and locations (including tie-in) for proposed potable water pipelines.

OFFSHORE DREDGING

The applicant has indicated that a revised offshore sediment analysis report will be provided. This analysis will need to be reviewed by the multi-agency Dredged Materials Management Office (DMMO) for further comment. The applicant will also need to address concerns raised by the SFRWQCB, the Department of Toxic Substances Control (DTSC), and the Bay Conservation and Development Commission (BCDC) including, but not limited to, additional site characterization, remediation activities, and coordination between the applicant and the agencies.

AQUATIC BIOLOGICAL RESOURCES

Staff cannot complete its aquatic biological resources analysis until the following issues are resolved:

- The potential impacts to aquatic resources of contaminants that may be exposed during dredging cannot be determined until the applicant provides the results of its second offshore sediment survey to determine the vertical and horizontal extent of contamination. This information will be provided by the applicant prior to the FSA along with the applicant's plan to avoid contamination during construction. Therefore, the FSA will provide an analysis of the potential impacts of contamination.
- The potential impacts to aquatic resources from exposure to contaminated creek sediments, and how they will be contained if there is a "frac-out" under Islais Creek during cable construction, needs to be better understood so staff can complete its analysis. It is expected that the applicant will provide this information prior to the FSA.
- The potential impacts to aquatic resources of the combined thermal plume from the new Unit 3 and Unit 7 outfall structures cannot be determined until the applicant provides the results of a model, accepted by staff, of the thermal plume from these discharges. It is expected that the extent of the thermal plume will be determined prior to the FSA, and that thermal plume impacts will be analyzed in the FSA.

Staff has concluded that permanent loss of Bay habitat from construction of the cooling water intake, and impingement and entrainment from the intake of Bay water for the cooling water system may be significant at both the project-specific and cumulative levels. It is anticipated that with sufficient mitigation/compensation those impacts can be mitigated to a less than significant level.

OVERVIEW OF POTENTIAL IMPACTS AND LEGAL REQUIREMENTS

It is staff's responsibility to complete an independent assessment of the project's potential effects on the environment and on the public's health and safety, and whether the project conforms to all applicable laws, ordinances, regulations and standards (LORS). The staff also recommends measures to mitigate all identified, potentially significant environmental effects of the project.

Staff's analysis also indicated that the project complies with all legal requirements (laws, ordinances, regulations and standards (LORS)) in most technical areas. Below is a summary of the potential environmental impacts and LORS compliance for each technical area.

Technical Discipline	Environmental Impact	LORS Conformance
Air Quality	fully mitigated	yes
Biological Resources	See above	yes
Cultural Resources	none	yes
Power Plant Efficiency	none	n/a
Power Plant Reliability	none	n/a
Facility Design	none	yes
Geology / Paleontology	none	yes
Hazardous Materials	fully mitigated	yes
Land Use	none	yes
Noise	fully mitigated	yes
Public Health	fully mitigated	yes
Socioeconomics	none	yes
Traffic and Transportation	fully mitigated	yes
Transmission Line Safety and Nuisance	none	yes
Transmission System Engineering	none	yes
Visual Resources	none	yes
Waste Management	none	yes
Soil and Water	See above	See above
Worker Safety	none	yes

RECOMMENDATION

Due to the remaining issues outlined above, staff cannot make a recommendation at this time, but expects to receive additional information that will enable it to complete the necessary analyses and to make a recommendation in the FSA.

**POTRERO POWER PLANT UNIT 7 PROJECT (00 AFC 4)
PRELIMINARY STAFF ASSESSMENT**

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INTRODUCTION

On May 31, 2000, Southern Energy Potrero, LLC (now Mirant Potrero, LLC) filed an Application for Certification (AFC) seeking approval from the California Energy Commission (Energy Commission) to construct and operate the Potrero Power Plant Unit 7 Project (Unit 7), a 540 megawatt (MW), natural gas-fired, combined cycle power plant. On July 12, 2000, the California Energy Commission found the AFC to be not data adequate. The applicant submitted an AFC Supplement on August 31, 2000, and the Energy Commission determined the supplemented AFC to be data adequate on October 11, 2000. A finding of data adequacy by the Commission begins staff's analysis of the project.

The applicant filed amendments to its applications on January 19, January 31, and April 20, 2001. The first two amendments and incorporated into the AFC the demolition of six existing structures¹. The third removed the originally proposed façade from the design. Many of the changes in the project were in response to input they received from the public and the City and County of San Francisco. Additional information was provided in response to information requests received through September 2000.

The Preliminary Staff Assessment (PSA) presents the Energy Commission staff's independent analysis of the Unit 7 AFC. The primary responsibility of the Energy Commission staff is to complete an independent assessment of the project's potential effects on the environment, the public's health and safety, and whether it conforms with all applicable laws, ordinances, regulations and standards (LORS). The staff also recommends measures to mitigate any identified, potential effects of the project. The PSA is prepared pursuant to Title 20, California Code of Regulations, sections 1742, 1742.5, 1743 and 1744.

The PSA is a staff document and is not a decision document pertaining to the Unit 7 project. The final decision will be made by the Energy Commission after completion of evidentiary hearings.

ORGANIZATION OF THE REPORT

The PSA describes the following:

- the proposed project;
- the existing environmental setting;
- whether the facilities can be constructed and operated safely and reliably in accordance with applicable laws, ordinances, regulations and standards (LORS);

¹ These structures include the Station A Complex (Station A Turbine Hall ("Power Plant" on AFC Figure 8-1), Compressor Building, Pump House, Meter House, and Gate House) and the Shop Building.

- the environmental consequences of the project, including potential public health and safety impacts;
- cumulative analysis of the potential impacts of the project, along with potential impacts from other existing and known planned developments;
- mitigation measures proposed by the applicant, staff, interested agencies and intervenors that may lessen or eliminate potential direct and cumulative impacts;
- proposed conditions under which the project should be constructed and operated, if it is certified; and
- project alternatives.

The analyses contained in this PSA are based upon information from: 1) the AFC; 2) supplements and amendments to the AFC; 3) responses to data requests; 4) information from local and state agencies; 5) concerned citizens; 6) existing documents and publications; and 7) independent field studies and research. The analyses for most technical areas include discussions of proposed conditions of certification. Each proposed condition of certification is followed by a proposed means of “verification”. The verification is the Energy Commission Compliance Unit’s method of ensuring post-certification compliance with adopted requirements. The PSA presents recommended conclusions and proposed conditions of certification that apply to the design, construction, operation and closure of the proposed facility.

The PSA contains an Executive Summary, Introduction, Project Description, a discussion of Need Conformance, and Project Alternatives. The environmental, engineering, and public health and safety analysis of the proposed project is contained in 20 technical areas. Each technical area is included in a separate chapter and are as follows: Air Quality, Public Health, Worker Safety and Fire Protection, Transmission Line Safety, Hazardous Material Management, Waste Management, Land Use, Traffic and Transportation, Noise, Visual Resources, Cultural Resources, Socioeconomic Resources, Aquatic Biological Resources, Terrestrial Biological Resources, Soil and Water Resources, Geology and Paleontology, Facility Design, Reliability, Efficiency, and Transmission System Engineering. These chapters are followed by a discussion of facility closure, project construction and operation compliance monitoring plans, and a list of staff that assisted in preparing this report.

Each of the 20 technical area assessments includes a discussion of:

- laws, ordinances, regulations and standards (LORS);
- the regional and site-specific setting;
- project specific and cumulative impacts;
- mitigation measures;
- closure requirements;

- conclusions and recommendations; and
- conditions of certification for both construction and operation (if applicable).

Disproportionate Impacts (Environmental Justice) issues are discussed in technical areas as needed.

ENERGY COMMISSION SITING PROCESS

The California Energy Commission has the exclusive authority to certify the construction and operation of thermal electric power plants 50 megawatts (MW) or larger. The Energy Commission certification is in lieu of any permit required by state, regional, or local agencies, and federal agencies to the extent permitted by federal law (Pub. Resources Code, section 25500). The Energy Commission must review AFCs to assess potential environmental impacts including potential impacts to public health and safety, potential measures to mitigate those impacts (Pub. Resources Code, section 25519), and compliance with applicable governmental laws or standards (Pub. Resources Code, section 25523 (d)).

The Energy Commission's siting regulations require staff to independently review the AFC and assess whether the list of environmental impacts contained is complete, and whether additional or more effective mitigation measures are necessary, feasible and available (Cal. Code Regs., tit. 20, sections 1742 and 1742.5(a)).

In addition, staff must assess the completeness and adequacy of the health and safety standards, and the reliability of power plant operations (Cal. Code Regs., tit. 20, section 1743(b)). Staff is required to develop a compliance plan (coordinated with other agencies) to ensure that applicable laws, ordinances, regulations and standards are met (Cal. Code Regs., tit. 20, section 1744(b)).

Staff conducts its environmental analysis in accordance with the requirements of the California Environmental Quality Act (CEQA). An Environmental Impact Report (EIR) is not required as the Energy Commission's site certification program has been certified by the Resources Agency (Public Resource Code, section 21080.5 and Cal. Code Regs. tit. 14, section 15251 (k)). The Energy Commission acts in the role of the CEQA lead agency and is subject to all other portions of CEQA.

Staff will issue its Final Staff Assessment (FSA) at some time after a 30-day public comment period on the PSA. The FSA will be only one piece of evidence that will be considered by the Committee (two commissioners who have been assigned to a specific project) in reaching a decision on whether or not to recommend that the full Energy Commission approve the proposed project. At the publicly-noticed evidentiary hearings all parties will be afforded an opportunity to present evidence, cross examine witnesses, and to rebut the testimony of other parties, thereby creating an evidentiary hearing record on which a decision on the project can be based. The hearing before the Committee also allows all parties to argue their positions on disputed matters and it provides a forum for the Committee to receive comments from the public and other governmental agencies.

Following the hearings, the Committee's recommendation to the full Energy Commission on whether or not to approve the proposed project will be contained in a document entitled the Presiding Members' Proposed Decision (PMPD). Following publication, the PMPD is distributed in order to receive written public comments. At the conclusion of the comment period, the Committee may prepare a revised PMPD. A revised PMPD is required to undergo a 15-day comment period. At the close of the comment period for the revised PMPD, the PMPD is submitted to the full Energy Commission for a decision. Within 30 days of the Energy Commission decision, any party may appeal the decision to the Energy Commission.

A Compliance Monitoring Plan and General Conditions will be assembled from conditions contained in the FSA and other evidence presented at the hearings. The Compliance Monitoring Plan and General Conditions will be presented in the PMPD. The Energy Commission staff's implementation of the plan ensures that a certified facility is constructed, operated, and closed in compliance with the conditions adopted by the Energy Commission.

PUBLIC AND AGENCY COORDINATION

Publicly noticed workshops and/or teleconferences were held on the following topics: air quality, biological resources, cultural resources, environmental justice, geology and paleontology, noise, power plant reliability, power plant efficiency, project siting alternatives, socioeconomics, soil and water resources, traffic and transportation, transmission system engineering, visual resources, and waste management. Five workshops were held in San Francisco, and two aquatic biology teleconferences were held in Sacramento prior to the completion of the Preliminary Staff Assessment (PSA).

Several of the workshops and teleconferences were attended by local, state and federal agencies including, but not limited to: CCSF, Bay Area Air Quality Management District (BAAQMD), California Department of Fish and Game (CDFG), and National Marine Fisheries Service (NMFS). These workshops and teleconferences have been held by staff to understand the issues and concerns of the public, intervenors, agencies, and the applicant. Many helpful comments were received during these events.

In addition to these workshops and teleconferences, extensive coordination has occurred with the numerous local, state and federal agencies that have an interest in the project. Energy Commission staff has worked with the California Independent System Operator (Cal-ISO), California Air Resources Board, U.S. Environmental Protection Agency, San Francisco Bay Regional Water Quality Control Board and California Department of Fish and others to identify and resolve issues of concern.

Written comments on this PSA will be taken into consideration in staff's following analysis, the Final Staff Assessment (FSA), where appropriate.

PROJECT DESCRIPTION

Marc Pryor

INTRODUCTION

On May 31, 2000, Southern Energy Potrero, LLC (now Mirant Potrero, LLC¹) filed an Application for Certification (AFC) seeking approval from the California Energy Commission (Energy Commission) to construct the Potrero Power Plant Unit 7 Project ("Unit 7" or "the project") in the Potrero District of the City and County of San Francisco. (PROJECT DESCRIPTION, Figure 1.) The Energy Commission found that the AFC was not data adequate on July 12, 2000. On August 31, 2000, the applicant filed its AFC Supplement. The Energy Commission determined the supplemented AFC to be data adequate on October 11, 2000. The determination started the discovery phase of the project.

Mirant Potrero, LLC, a direct subsidiary of Mirant Corporation, and will own and operate Unit 7 in conjunction with the existing Potrero Power Plant's Unit 3 (a 206-megawatt (MW) baseload steam turbine), and units 4, 5 and 6 (52-MW distillate fired peaking units). The Potrero Power Plant was purchased by Southern from Pacific Gas & Electric (PG&E) in April 1999.

DESCRIPTION

GENERAL

Unit 7 would be operated as a merchant power facility. Electric output and operational levels would vary according to demand in the deregulated California energy market. Electricity prices and operational levels would not be subject to California Public Utilities Commission (CPUC) regulation. Mirant expects the Unit 7 project to cost between \$260 and \$320 million and to be operational by the summer of 2003.

LOCATION

The proposed Unit 7 project would be located at the existing Potrero Power Plant site, on the Eastern Shore of the City and County of San Francisco. This site lies approximately mid-way between Hunters Point (about two miles to the south) and the San Francisco side of the San Francisco-Oakland Bay Bridge (about two miles to the north). (See PROJECT DESCRIPTION Figures 1 and 2.) Located on fill materials that been in place for many decades, the Potrero Power Plant is within an industrial setting that features different uses, including the San Francisco Drydock, Company, the last remaining large commercial drydock in the United States. (See the **Land Use** and **Cultural Resources** sections for more detailed information on setting and history.)

¹ On February 7, 20001, the Energy Commission was informed of two name changes. Southern Energy, Inc. is now Mirant Corporation (Mirant), and Southern Energy Potrero, LLC is now Mirant Potrero, LLC.

POWER PLANT

EXISTING POWER PLANT

Major existing site features include:

- Unit 3, a 206-MW, natural gas-fired steam turbine generator. This unit features cooling water intake/outfall structures for once-through cooling. These structures would be replaced by new intake/discharge systems. In addition, Unit 3 will be outfitted with new pollution control apparatus.
- Three distillate-fired 52-MW peaking units, Units 4, 5 and 6.
- Three fuel tanks. Two are emergency fuel storage for Unit 3, should natural gas service be interrupted and Unit 3 is forced to burn fuel oil. The third tank holds the distillate fuel for Units 4, 5 and 6.
- Station A Complex: turbine room, pump house and gate house.
- Gas plant structures: Meter House and Compressor House.

(See PROJECT DESCRIPTION Figures 3 and 4.)

PROPOSAL

UNIT 7

Proposed to be located in west-center portion of the site where the existing turbine building stands, the proposed Unit 7 would be a nominal 540-MW natural gas-fired, combined cycle power generating facility. Unit 7 would feature two Combustion Turbine Generators (CTGs) and one Steam Turbine Generator (STG). Heat generated from each CTG (a combustion cycle) will flow through a separate Heat Recovery Steam Generator (HRSG) where steam will be produced, which will be used to drive the STG (a steam cycle). This two CTG/HRSG and one STG set up is referred to as a “two-on-one combined-cycle configuration². (PROJECT DESCRIPTION, Figures 5, 6 and 7.)

Pollution controls on each CTG/HRSG “train” will include a Selective Catalytic Reduction (SCR) system to control the emissions of oxides of nitrogen (NO_x), and a CO catalyst to control carbon monoxide emissions. Aqueous ammonia, which is already used at Unit 3, will be used as the reagent in Unit 7’s SCR system. Deliveries will be made by tanker trucks and stored in two identical, 20,000-gallon aboveground storage tanks. One tank will be used for Unit 7; the other tank will replace the existing Unit 3 storage.

UNIT 3 RETROFIT

The existing Unit 3’s pollution control systems will be retrofitted in 2004 with emissions control equipment.

² Mirant’s original proposal included a brick-like façade around the CTG/HRSG power blocks. This façade was designed to appear similar to the existing Station A Power Plant building. In March 2001, Mirant removed the façade from its proposal. (SECAL 2001a.)

NATURAL GAS SUPPLY

The existing Potrero site's PG&E natural gas supply will fuel the proposed Unit 7. A pipe tie-in will be made to the gas distribution line and this service will be connected to a compressor station which will be part of Unit 7.

Waters from San Francisco Bay are proposed to be used for circulating cooling purposes at the rate of 158,000 gallons per minute (228 million gallons per day). New water intake structure and discharge systems will be constructed at the shoreline, and would provide cooling water for both Units 3 and 7. As noted above, Unit 3's existing intake and outfall systems would be replaced with the new system. Discharged circulating cooling water will be returned to the bay via four pipes equipped with diffusion heads that will be located about 900 feet offshore from the plant site. Unit 3's set of discharge pipes will enter the bay near that unit, and the pipes for Unit 7 will enter the bay at the southeast corner of the property. (PROJECT DESCRIPTION Figure 8 through 10.)

Water supplied by the City of San Francisco's system will be used for the replacement, or "makeup", of water used in the steam production process, evaporative coolers, as well as for wash water and potable water. The combined rate of consumption of this water will be about 50 gallons per minute (72,000 gallons per day).

TRANSMISSION SYSTEM

Interconnection with the state's high voltage transmission system would be through a proposed new Potrero Power Plant Switchyard, located onsite, and to two existing PG&E substations. These would be a direct interconnection to PG&E's Potrero Substation adjacent to the Potrero Power Plant, and a separate underground interconnection to the Hunters Point Substation located approximately 1.8 miles to the south of the Potrero Power Plant site. (PROJECT DESCRIPTION Figure 2.)

DEMOLITION OF EXISTING STRUCTURES

In the January 19 and 31, 2001 amendments to the AFC the applicant brought the demolition of six existing structures into the project. The Station A Complex (turbine room, pump house and gate house) and the compressor house were originally slated to be removed under permits issued by the CCSF, but due to urgings by the CCSF and delays, demolition was included in the Energy Commission's process. (PROJECT DESCRIPTION Figure 11 shows the six structures.) (SECAL 2001a and b.)

PROJECT DESCRIPTION Figure 1
Potrero Power Plant Unit 7 Project
Regional Location

PROJECT DESCRIPTION Figure 2
Potrero Power Plant Unit 7 Project
Local Map
(URS 5/24/00 Figure 2-11)

PROJECT DESCRIPTION Figure 3
Potrero Power Plant Unit 7 Project
Photo of Existing Plant Site
(URS 5/23/00 Figure 1-2)

PROJECT DESCRIPTION Figure 4
Potrero Power Plant Unit 7 Project
Existing Facility Layout without the Proposed Unit 7
(URS 4/27/01 Figure 2A)

PROJECT DESCRIPTION Figure 5
Potrero Power Plant Unit 7 Project
Photo Simulation of the Plant Site with the Proposed Unit 7
(URS 4/19/01 Revised Figure 1-3)

PROJECT DESCRIPTION Figure 6
Potrero Power Plant Unit 7 Project
Facility Layout with the Proposed Unit 7
(URS 4/26/01 Figure 2B)

PROJECT DESCRIPTION Figure 7
Potrero Power Plant Unit 7 Project
Elevation of the Proposed Unit 7
(URS 5/18/01 Replacement Figure 2-3)

PROJECT DESCRIPTION Figure 8
Potrero Power Plant Unit 7 Project
Proposed Intake Structure and Discharge Pipelines
(URS 4/30/01 Figure 2)

PROJECT DESCRIPTION Figure 9
Potrero Power Plant Unit 7 Project
Proposed Intake Structure Site Plan
(URS 4/30/01 Figure 1)

PROJECT DESCRIPTION Figure 10
Potrero Power Plant Unit 7 Project
Cooling Water Intake Structure Design
(URS 5/24/01 Figure 7-2)

PROJECT DESCRIPTION Figure 11
Potrero Power Plant Unit 7 Project
Structures Proposed for Demolition
(URS 1/29/01 Figure 8-1)

REFERENCES

SECAL (Southern Energy California). 2000a. Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, May 31, 2000.

SECAL (Southern Energy California). 2000b. Supplemental Information in Response to CEC Data Adequacy Request, Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, August 31, 2000.

SECAL (Southern Energy California). 2001a. Amendment to the Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Addresses the demolition of six existing structures. Submitted to the California Energy Commission, January 19, 2001.

SECAL (Southern Energy California). 2001b. Amendment to the Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Addresses data responses to staff's Data Requests 30 – 32 (Cultural Resources), revises AFC Section 8.3, Cultural Resources, and AFC Appendix R, Cultural Resources. Submitted to the California Energy Commission, January 31, 2001.

MIRANT (Mirant Corp.). MIRANT2001d. Supplemental Information to the Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Addresses 1) Intake and Discharge Structural Modifications; and 2) Figures I and II. Submitted to the California Energy Commission, May 2, 2001.

MIRANT (Mirant Corp.). MIRANT2001f. Amendment to the Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Addresses removal of the façade from the proposed project. Submitted to the California Energy Commission, April 20, 2001.

ENVIRONMENTAL ASSESSMENT

AIR QUALITY

Tuan Ngo, P.E.

INTRODUCTION

This analysis addresses the potential air quality impacts resulting from criteria air pollutant emissions created by the construction and operation of the Potrero Power Plant Unit 7 Project (Unit 7). Criteria air pollutants are those for which a state or federal standard has been established. They include nitrogen dioxide (NO₂), sulfur dioxide (SO₂), carbon monoxide (CO), ozone (O₃) and its precursors (NO_x and VOC), volatile organic compounds (VOC), particulate matter less than 10 microns in diameter (PM₁₀) and its precursors: NO_x, VOC, SO_x, and lead (Pb).

In carrying out this analysis, the California Energy Commission staff evaluated the following major points:

- whether the project is likely to conform with applicable Federal, State and the Bay Area Air Quality Management District (District) air quality laws, ordinances, regulations and standards, as required by Title 20, California Code of Regulations, section 1742.5 (b);
- whether the project is likely to cause significant air quality impacts, including new violations of ambient air quality standards or contributions to existing violations of those standards, as required by Title 20, California Code of Regulations, section 1742 (b); and
- whether the mitigation proposed for the project is adequate to lessen the potential impacts to a level of insignificance, as required by Title 20, California Code of Regulations, section 1744 (b).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

The federal Clean Air Act requires any new major stationary sources of air pollution and any major modifications to major stationary sources to obtain a construction permit before commencing construction. This process is known as New Source Review (NSR). Its requirements differ depending on the attainment status of the area where the major facility is to be located. Prevention of Significant Deterioration (PSD) requirements apply in areas that are in attainment of the national ambient air quality standards. The non-attainment area NSR requirements apply to areas that have not been able to demonstrate compliance with national ambient air quality standards. The entire program, including both PSD and non-attainment NSR permit reviews, is referred to as the federal NSR program.

Title V of the federal Clean Air Act requires states to implement and administer an operating permit program to ensure that large sources operate in compliance with

the requirements included in Title 40, Code of Federal Regulations, Section 70. A Title V permit contains all of the requirements specified in different air quality regulations which affect an individual project.

The U.S. Environmental Protection Agency (EPA) has reviewed and approved the Bay Area Air Quality Management District's regulations and has delegated to the District the implementation of the federal PSD, Non-attainment NSR, and Title V programs. The District implements these programs through its own rules and regulations, which are, at a minimum, as stringent as the federal regulations.

The Unit 7's gas turbines are also subject to the federal New Source Performance Standards (NSPS). These standards include a NO_x emissions concentration of no more than 75 parts per million (ppm) at 15 percent excess oxygen (ppm@15%O₂), and a SO_x emissions concentration of no more than 150 ppm@15%O₂.

STATE

California State Health and Safety Code, Section 41700, requires that: "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerate number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property."

LOCAL

As part of the licensing process, in lieu of issuing a construction permit to the applicant for the Unit 7, the District will prepare and present to the California Energy Commission a Determination of Compliance (DOC). The DOC will evaluate whether and under what conditions the proposed project will comply with the District's applicable rules and regulations, as described below. The Commission staff will coordinate its air quality analysis with the District staff as they prepare the DOC, will review and comment on the Preliminary DOC to identify any issues of concern, and will incorporate the Final DOC recommended conditions of certification in its Final Staff Assessment.

The project is subject to the specific District rules and regulations that are briefly described below:

REGULATION 2

Rule 1 - General Requirements. This rule contains general requirements, definitions, and a requirement that an applicant submit an application for an authority to construct and permit to operate.

Rule 2 - New Source Review. This rule applies to all new and modified sources. The following sections of Rule 2 are the regulations that are applicable to this project.

- Section 2-2-301 - Best Available Control Technology (BACT) Requirement: This rule requires that BACT be applied for each pollutant which is emitted in excess of 10.0 pounds per day.

- Section 2-2-302 - Offset Requirement, Precursor Organic Compounds and Nitrogen Oxides. This section applies to projects with an emissions increase of 50 tons per year or more of organic compounds and/or NO_x. Offsets shall be provided at a ratio of 1.15 tons of emission reduction credits for each 1.0 ton of proposed project permitted emissions.
- Section 2-2-303 - Offset Requirements, Particulate Matter (TSP), PM₁₀ and Sulfur Dioxide: If a Major Facility (a project that emits any pollutant greater than 100 tons per year) has a cumulative increase of 1.0 ton per year of PM₁₀ or SO₂, emission offsets must be provided for the entire cumulative increase at a ratio of 1.0:1.0.
- Emission reductions of nitrogen oxides and/or sulfur dioxide may be used to offset increased emissions of PM₁₀ at offset ratios deemed appropriate by the Air Pollution Control Officer.
- A facility which emits less than 100 tons of any pollutant may voluntarily provide emission offsets for all, or any portion, of their PM₁₀ or sulfur dioxide emissions increase at the offset ratio required above (1.0:1.0).
- Section 2-2-606 - Emission Calculation Procedures, Offsets. This section requires that emission offsets must be provided from the District's Emissions Bank, and/or from contemporaneous actual emission reductions.
- Rule 7-Acid Rain. This rule applies the requirements of Title IV of the federal Clean Air Act, which are spelled out in Title 40, Code of Federal Regulations, Section 72. The provisions of Section 72 will apply when EPA approves the District's Title V program, which has not been approved at this time. The Title IV requirements will include the installation of continuous emission monitors to monitor acid deposition precursor pollutants.

REGULATION 6

Particulate Matter and Visible Emission. The purpose of this regulation is to limit the quantity of particulate matter in the atmosphere. The following two sections of Regulation 6 are directly applicable to this project:

- Section 301 - Ringelmann No. 1 Limitation: This rule limits visible emissions to no darker than Ringelmann No. 1 for periods greater than three minutes in any hour.
- Section 310 - Particulate Weight Limitation: This rule limits source particulate matter emissions to no greater than 0.15 grains per standard dry cubic foot.

REGULATION 9

Rule 1 - Limitations

- Section 301: Limitations on Ground Level Sulfur Dioxide Concentration. This section requires that emissions of sulfur dioxide shall not impact at ground level in excess of 0.5 ppm for 3 consecutive minutes, or 0.25 ppm averaged over 60 minutes, or 0.05 ppm averaged over 24 hours.
- Section 302: General Emission Limitation. This rule limits the sulfur dioxide concentration from an exhaust stack to no greater than 300 ppm dry.

Rule 9 - Nitrogen Oxides from Stationary Gas Turbines. Effective January 1, 1997, this rule will limit gaseous fired, SCR equipped, combustion turbines rated greater than 10 MW to 9 ppm@15%O₂.

REGULATION 10

Rule 26 - Gas Turbines - Standards of Performance for New Stationary Sources. This rule adopts the national maximum emission limits (40 CFR 60) which are 75 ppm NO_x and 150 ppm SO₂ at 15 percent O₂. Whenever any source is subject to more than one emission limitation rule, regulation, provision or requirement relating to the control of any air contaminant, the most stringent limitation applies.

SETTING

METEOROLOGY AND CLIMATE

The project is proposed to be located in the eastern part of San Francisco. The site is a few feet above sea level and is in close proximity to the San Francisco Bay. The climate of the San Francisco area is dominated by a semi-permanent, high pressure system off the Pacific Coast, known as the Pacific High. During the summer months, the Pacific High extends to and often over the western United States, causing low pressure systems to pass north of the Pacific High into Canada. The relatively colder temperatures of the Pacific Ocean cause coastal stratus and fog to form. Brisk westerly winds blow throughout the afternoon and evening hours, which carry fog inland in the late afternoon and evening. The fog can often persist through mid-morning.

During the winter months, the Pacific High moves south, allowing low pressure systems to move through California. Cloud cover, precipitation, and generally strong winds prevail during this period.

About 80 percent of the average annual rainfall (approximately 20 inches) in the area occur between the months of November and March. Between storms, skies are fair, winds are light, and temperatures are moderate.

Temperatures in the general area of the site are moderated due to their proximity to the ocean and to the San Francisco Bay. The temperatures range from the mid-50s to low-70s in the summer, fall and spring, and from the mid-40s to low-60s during the winter.

Pacific Gas and Electric (PG&E) collects meteorological data at the project site. The data collected include wind directions, wind speed, temperature, and atmospheric stability class. The District has determined that the collected meteorological data are representative of the area's meteorology, and that it is appropriate to use for air quality dispersion modeling analysis for this project.

Quarterly wind roses, which are graphic representations showing wind speeds and directions based on data collected in 1992, are shown in Appendix A. At the project site, the winds blow predominately from the west from April through September. From October through February, the wind directions are more variable, with winds blowing predominately from the north, southeast and west.

Mixing heights in the area, which represent the altitudes to which different air masses mix together, have been estimated to range from a low of approximately 80 meters in the morning to a high of 2,300 meters in the afternoon. High mixing heights, normally associated with unstable conditions, can lead to greater dispersion of air contaminants (Smith et al. 1984). When the mixing height is low and the wind is calm, air contaminants can be trapped near the ground.

EXISTING AMBIENT AIR QUALITY

The Federal Clean Air Act and the California Clean Air Act both require the establishment of allowable maximum ambient concentrations of air pollutants, called ambient air quality standards (AAQS). The state AAQS, established by the Air Resources Board (ARB), are typically lower (more protective) than the federal AAQS, which are established by the federal Environmental Protection Agency (EPA). The state and federal air quality standards are listed in Air Quality Table 1. As indicated in Air Quality Table 1, the averaging times for the various air quality standards, the times over which they are measured, range from one-hour to an annual average. The standards are read as a concentration, in parts per million (ppm), or as a weighted mass of material per a volume of air, in milligrams or micrograms of pollutant in a cubic meter of air (mg/m^3 and $\mu\text{g}/\text{m}^3$).

In general, an area is designated as attainment if the concentration of a particular air contaminant does not exceed the standard. Likewise, an area is designated as non-attainment for an air contaminant if that contaminant standard is violated. Where not enough ambient data are available to support designation as either attainment or non-attainment, the area can be designated as unclassified. The unclassified area is normally treated the same as an attainment area for regulatory purposes. An area could be attainment for one air contaminant while non-attainment for another, or attainment for the federal standard and non-attainment for the state standard for the same air contaminant. The entire area within the boundaries of the air district is usually evaluated to determine the district's attainment status. The District includes all or portions of nine counties in the Bay Area: all of San Francisco, San Mateo, Santa Clara, Alameda, Contra Costa, Napa and Marin Counties, and the southwest portion of Solano County and the southern portion of Sonoma County.

AIR QUALITY Figure 1 summarizes the historical air quality data for the project location for particulate matter less than 10 microns (PM₁₀), CO, SO₂, O₃, and NO₂. In **AIR QUALITY Figure 1**, the normalized concentrations represent the ratio of the highest measured concentrations in a given year to the most stringent applicable national or state ambient air quality standard. Therefore, normalized concentrations lower than one indicate that the measured concentrations were lower than the most stringent ambient air quality standard. Based on the ambient concentration data collected, the area is consistently maintained below the most stringent ambient air quality standards for all criteria pollutants except for PM₁₀. Below is an in-depth discussion of ambient air quality conditions in the Potrero area for ozone, NO₂, CO and PM₁₀.

OZONE

Ozone is not directly emitted from stationary or mobile sources, but is formed as the result of chemical reactions in the atmosphere between directly emitted air pollutants. Nitrogen oxides (NO_x) and hydrocarbons (Volatile Organic Compounds [VOC]) interact in the presence of sunlight to form ozone.

The ambient ozone concentrations recorded between 1990 and 1999 have ranged from 5 to 9 parts per hundred millions (pphm). The area did not experience any violations of either the state or federal ozone air quality standards.

AIR QUALITY Figure 2 represents the ozone concentrations of the area (between 1993 to 1999) compare to other cities surrounding the site. This figure shows that the area, during that time period, did not experience a violation of any ozone air quality standard. It also shows that the ambient ozone air quality is the cleanest among other surrounding cities.

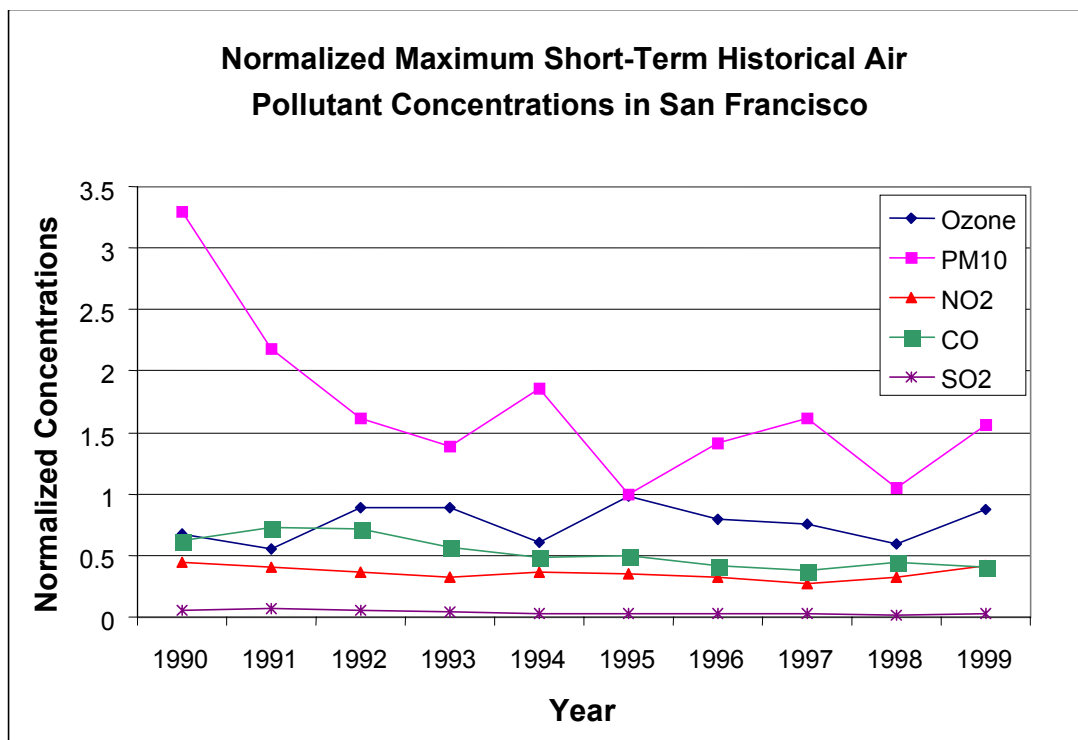
AIR QUALITY Table 1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	Federal Standards	
			Primary	Secondary
Ozone(O ₃)	1-hour	0.09 ppm (180 µg/m ³)	0.12 ppm (235 µg/m ³)	Same as primary
Particulate Matter (PM ₁₀)	Ann.Geo. Mean	30 µg/m ³	---	Same as primary
	24-hour	50 µg/m ³	150 µg/m ³	
	Ann.Arit. Mean	---	50 µg/m ³	
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)	None
	8-hour	9 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)	
Nitrogen Dioxide (NO ₂)	1-hour	0.25 ppm (470 µg/m ³)	---	Same as primary
	Ann.AritMean	---	0.053 ppm (100 µg/m ³)	

Lead(Pb)	30-day	1.5 $\mu\text{g}/\text{m}^3$	---	Same as primary
	Cal. Quarter	---	1.5 $\mu\text{g}/\text{m}^3$	
Sulfur Dioxide (SO ₂)	Ann.Arit. Mean	---	0.03 ppm (80 $\mu\text{g}/\text{m}^3$)	---
	24-hour	0.04 ppm (105 $\mu\text{g}/\text{m}^3$)	0.147 ppm (365 $\mu\text{g}/\text{m}^3$)	---
	3-hour	---	---	0.5 ppm (1300 $\mu\text{g}/\text{m}^3$)
	1-hour	0.25 ppm (655 $\mu\text{g}/\text{m}^3$)	---	---
Sulfates	24-hour	25 $\mu\text{g}/\text{m}^3$	No federal standard	
H ₂ S	1-hour	0.03 ppm (42 $\mu\text{g}/\text{m}^3$)	No federal standard	

Source: California Air Resources Board

AIR QUALITY Figure 1



Source: Air Resources Board

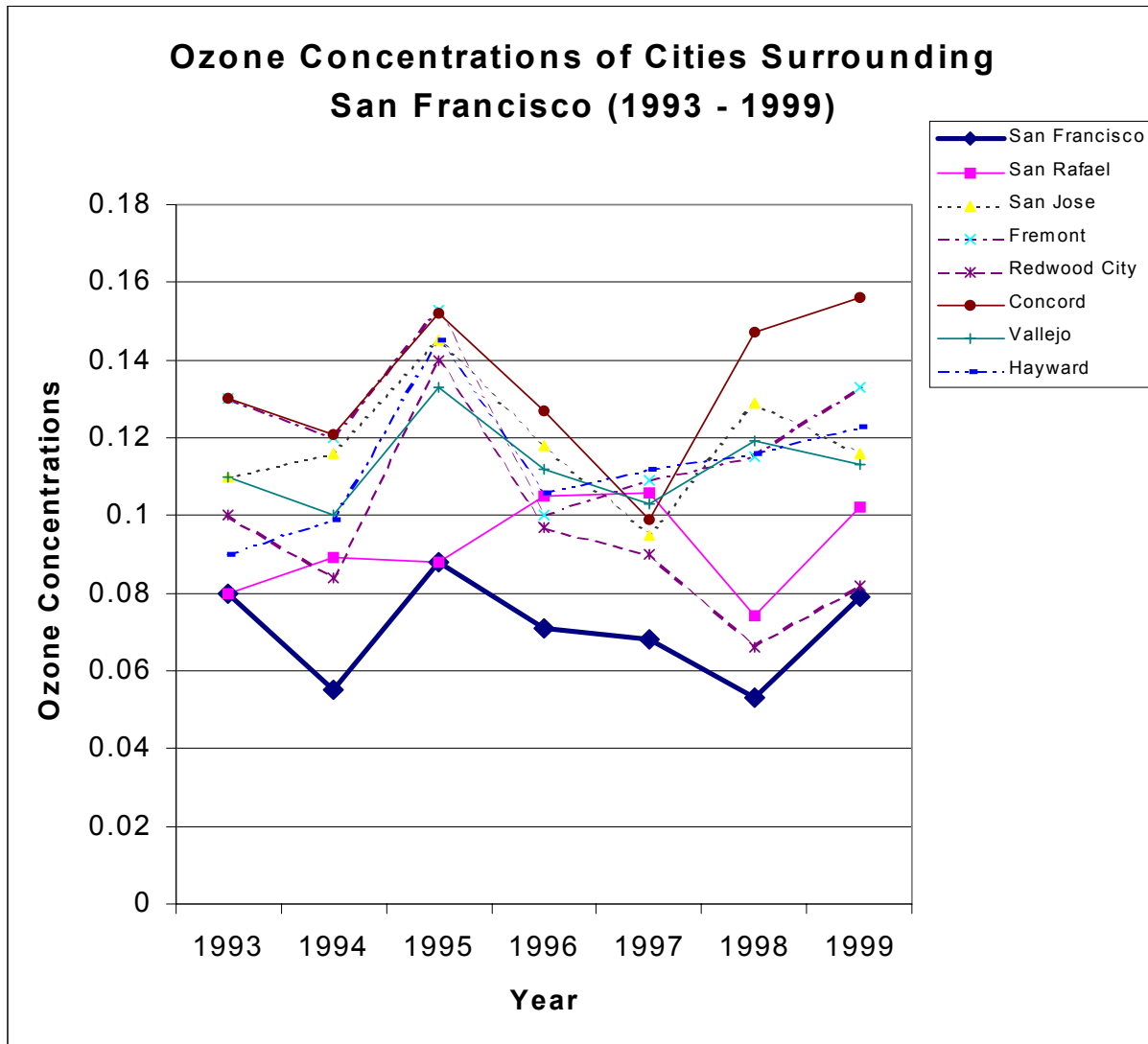
NITROGEN DIOXIDES (NO₂)

NO₂ levels in Potrero are no more than half of the most stringent NO₂ ambient air quality standards, as shown in **AIR QUALITY Figure 1**. Approximately 90 percent of the NO_x emitted from combustion sources is NO, while the balance is NO₂. NO is oxidized in the atmosphere to NO₂, but some level of photochemical activity is needed for this conversion. This is why the highest concentrations of NO₂ occur during the fall and not in the winter when atmospheric conditions favor the trapping of ground level releases but lack significant photochemical activity (less sun light). In the summer the conversion rates of NO to NO₂ are high but the relatively high temperatures and windy conditions (atmospheric unstable conditions) disperse pollutants, preventing the accumulation of NO₂ to levels approaching the 1-hour ambient air quality standard.

CARBON MONOXIDE (CO)

The highest CO concentration levels measured in Potrero are at least 30 percent lower than the most stringent California ambient air quality standards and are going to a slight downward trend (see **AIR QUALITY Figure 1**). The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap

AIR QUALITY Figure 2

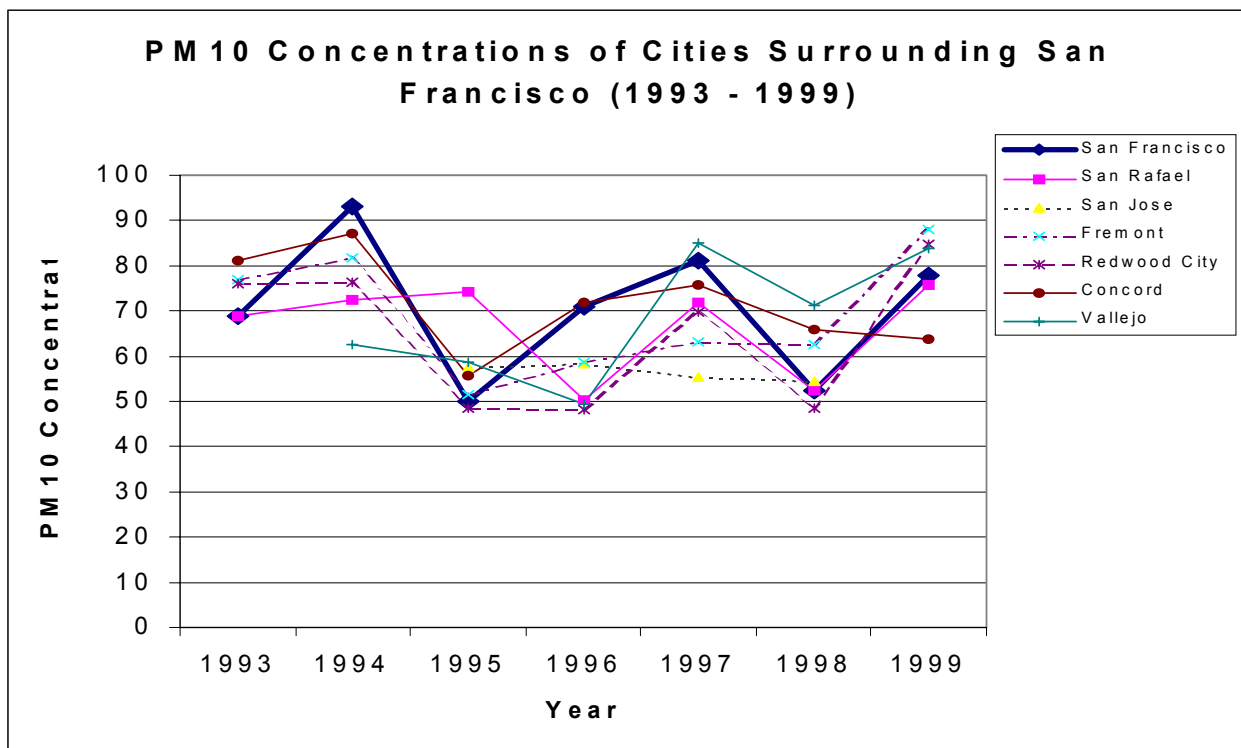


the pollution emitted at or near ground level in what is known as the stable boundary layer. These conditions occur frequently in the wintertime late in the afternoon, persist during the night and may extend one or two hours after sunrise. Since the mobile sector (cars, trucks, and buses) is the main source of CO, we expect ambient concentrations of CO to be highly dependent on emissions from the mobile sector.

PARTICULATE MATTER (PM_{10})

As shown in **AIR QUALITY Figure 1**, PM_{10} concentrations measured at the site show a declining trend in the last ten years. The highest PM_{10} concentrations are normally measured in the winter, especially during evening and night hours (BAAQMD, 2000). During wintertime high PM_{10} episodes, the main sources of

AIR QUALITY Figure 3



PM₁₀ contributions are wood smoke, combustion of fossil fuels, and entrained dust particles. On an annual basis, since 1995, the area has experienced one to six violations of the state 24-hour PM₁₀ air quality standard during late fall and early winter.

AIR QUALITY Figure 3 represents the PM₁₀ concentrations of the area (between 1993 to 1999) compare to other cities surrounding the site. This figure shows that the area measured PM₁₀ concentrations correspond to at the same levels measured at the surrounding sites in the Bay area.

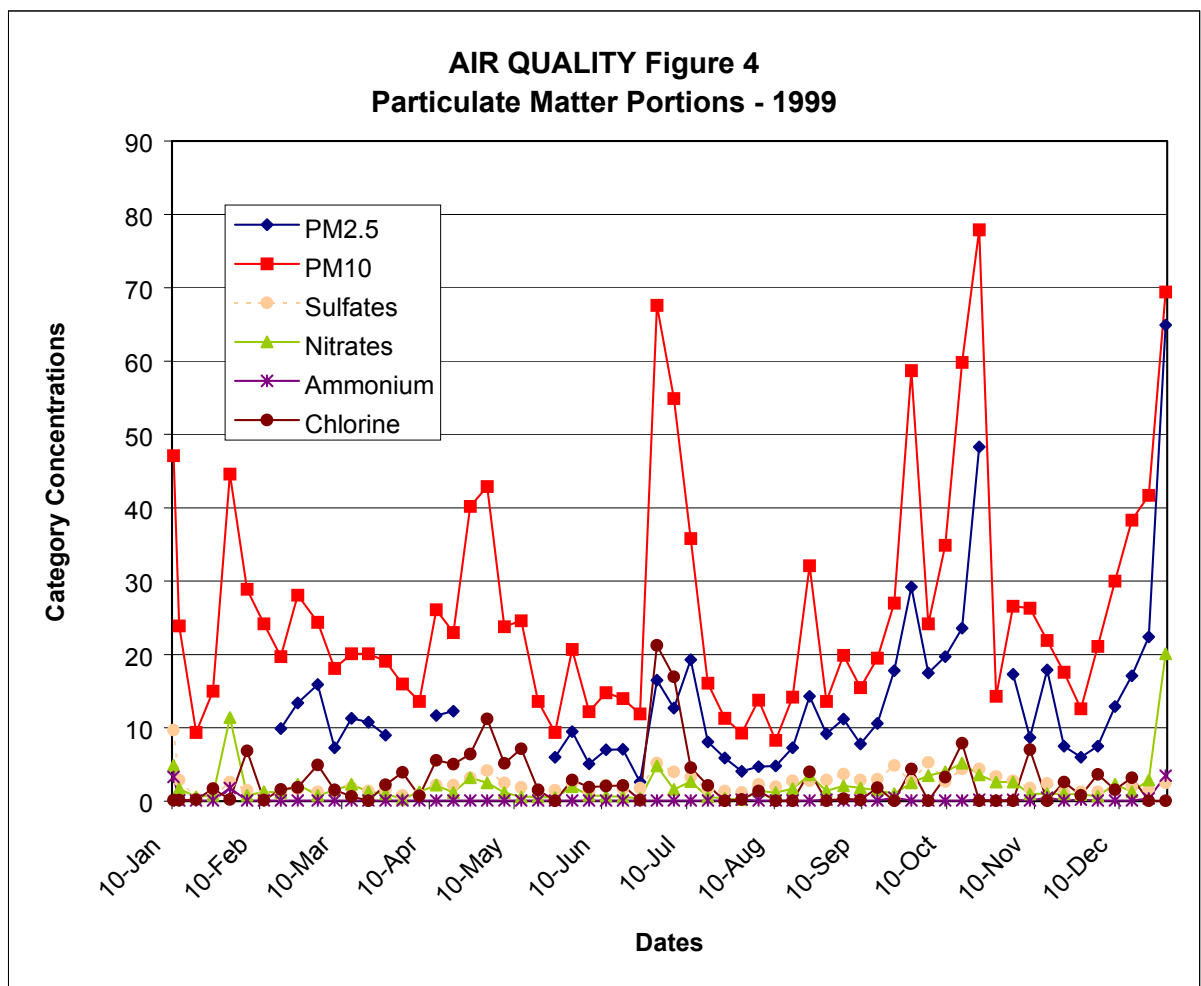
AIR QUALITY Figure 4 shows the highest measurements of PM₁₀, PM_{2.5} (particulate matters that are less than 2.5 microns in diameter) and particulates that are nitrates, sulfates, ammonium and chlorine based. These measurements were taken at the Arkansas Street monitoring station in 1999. **AIR QUALITY Figure 4** shows that the PM_{2.5} portion (which is generally caused by combustion processes from industrial, mobile sources and domestic activities) typically corresponds to and remains within 40 to 50 percent of the measured PM₁₀. It should be noted, however, chlorine based particulate (sea salts) can account for between 3 to 30 percent of the ambient PM₁₀ measured. Staff believes that spray salts can influence the measured PM₁₀ due to the monitoring station location in proximity of the ocean.

NITRATES AND SULFATES

PM nitrate (mainly ammonium nitrate) is formed in the atmosphere from the reaction of nitric acid and ammonia. Nitric acid formed from NO_x emissions originated from

combustion sources. **AIR QUALITY Figure 4** shows that the nitrate ion concentrations during the winter time can range from 5 to 30 percent of the total PM₁₀ and could be an even higher contributor to particulate matter of less than 2.5 microns (PM_{2.5}).

PM sulfate (mainly ammonium sulfate) is formed in the atmosphere from the oxidation of SO₂ and subsequent neutralization by ammonia in the atmosphere. The oxidation of SO₂ depends on many factors, which includes: the availability of hydroxyl (OH), hydroperoxy (HO₂) and Methylperoxy (CH₃OH), and humidity. **AIR QUALITY Figure 4** shows that the sulfate portion can range from 5 to 20 percent of the total PM₁₀ measured.



Source: Air Resources Board Ambient Air Quality Data.

PROJECT EMISSIONS

CONSTRUCTION ACTIVITIES

The construction of the proposed project, including the demolition of the existing Station A structures, will last approximately 24 months. The construction generally consists of three major activities: demolition of the existing building, site preparation, and construction and installation of major equipment and structures. The applicant provided estimated peak hourly, monthly and annual construction equipment exhaust emissions (SECAL, 2001a). These estimated construction emissions are identified in **AIR QUALITY Table 2**. Staff reviewed the applicant's estimated construction emissions, and believes that they are accurate.

Emissions from construction equipment exhausts, such as vehicles and internal combustion engines, are also expected during the project construction phase. A small amount of hydrocarbon emissions may also occur as a result of the temporary storage of petroleum fuel at the site.

AIR QUALITY Table 2
Construction Emissions

Construction Emission Sources	NO _x	SO ₂	VOC	CO	PM ₁₀
Hourly (lbs/hr)	35	3	4	14	1
Monthly (lbs/mo.)	7,120	650	740	2,750	194
Annual (tons/yr)	27	3	3	10	1
Fugitive Dust (tons/yr)					9

Sources: SECAL, 2001a. Amendment to AFC, Section 8.1.2.1 and Tables 8.1-8, January 19, 2001.

PROJECT OPERATION

The project will be built with the following major components:

- Two natural gas fired, General Electric (GE) Frame 7FA combustion turbines,
- Two heat recovery steam generators (HRSG),
- One steam turbine.

The turbines will be operating in combined cycle mode to produce approximately 530 MW of electricity. The facility is expected to be between 75 to 85 percent available and can operate up to 8,626 hours per year. Each HRSG will be equipped with a 390 MMBTU/hr duct burner to increase steam production. The applicant proposes to equip each combustion turbine with a dry low NO_x combustor and a selective catalytic reduction (SCR) system in the HSRG, which together limits the NO_x emissions to 2.5 ppm@15% O₂. To control the CO and VOC emissions, the applicant proposes to equip each combustion turbine/HRSG with a high-

temperature oxidation catalyst system, which limits the CO emissions to 6 ppm and the VOC emissions to 2 ppm (SECAL, 2000a. AFC Table 8.1-26).

The applicant is requesting that the project be analyzed with the assumption of 28 cold-starts, 11 hot-starts and 39 shutdowns for both turbines each year (SECAL, 2000a. AFC Section 8.1.2.2). A hot start would occur after an overnight turbine shutdown. The duration of a hot start is approximately 90 minutes. A cold start takes considerably longer, as much as four and half hours. However, this type of start-up would be rare, occurring only after the turbines have been under extended shutdown, such as the annual maintenance inspection that the manufacturer may require.

The facility's hourly, daily and annual emissions were estimated based on information on the GE 7F turbines provided by the applicant, and are presented in **AIR QUALITY Tables 3 and 4**.

The daily and annual emissions from the project are shown in **AIR QUALITY Table 4**. The table shows different operating scenarios, and the resultant emissions, including CTG startup (cold and hot), shutdown, and steady state operation.

INITIAL COMMISSIONING

The initial commissioning refers to a period of approximately 60 days prior to beginning commercial operation when the combustion turbines will undergo initial test firing. During this commissioning phase, the project may operate at a low-load for a long period of time for fine-tuning. The District typically requires that each activity of the commissioning period be planned carefully, and that all NO_x and CO emissions and the time of commissioning be optimized to lessen the emissions from the turbines, duct burners and HRSG. It should also be noted that the NO_x and CO emissions during the commissioning period are not higher than emissions during normal start up of the facility; therefore, staff expects no new impacts of the emissions during the commissioning period. All criteria air contaminant emissions during the commissioning period will be counted toward the annual emission limits; thus there is an incentive for the applicant to limit the commissioning period to the shortest time possible.

CLOSURE

Eventually the facility will close, either as a result of the end of its useful life, or through some unexpected situation, such as a natural disaster or catastrophic facility breakdown. When the facility closes, all sources of air emissions will

AIR QUALITY Table 3
Project Hourly Emissions
 (pound per hour [lb/hr] except where noted)

Operational Profile	N O _x	S O ₂	P M ₁₀	V O C	C O
Cold Start-up (total emissions for 4.5 hours)	900	28	94	220	1,980
Hot Start-up (total emissions for 90 min.)	380	10	34	54	580
Shutdown (total emissions for 30 min.)	120	2	6	12	150
Steady State @ 100% load	40	12	26	11	60

Source: SECAL, 2000a. AFC Tables 8.1-9, 8.1-10.

AIR QUALITY Table 4
Project Daily and Annual Emissions

Operational Profile	NO _x	S O ₂	PM ₁₀	VO C	CO
2 turbine sequential cold-start, hot start and steady state operation (maximum daily) (lbs/day)	2,000	250	600	470	3,640
Maximum steady state daily operation (lbs/day)	960	290	620	260	1,400
Maximum annual emissions including start ups and shutdown ¹ (tons/year)	178	52	110	49	265

Notes:

¹ Assume 4.5 hr for each cold start, 1.5 hr for each hot start, 14,180 hrs. steady state with duct burner and the rest at steady state without duct burner.

Source: SECAL, 2000a. AFC Tables 8.1-9 and 8.1-10.

cease and all impacts associated with those emissions will no longer occur. The only other expected emissions will be fugitive particulate emissions from the dismantling activities. These activities will be short term and will create fugitive dust emissions levels much lower than those created during the construction of the project. Nevertheless, staff recommends that a facility closure plan be submitted to the Energy Commission Compliance Project Manager to demonstrate compliance with applicable District Rules and Regulations during closure activities.

AMMONIA EMISSIONS

Due to the large combustion turbines used in this project and the need to control NO_x emissions, significant amounts of ammonia will be injected into the flue gas stream as part of the SCR system. Not all of this ammonia will mix with the flue gases to reduce NO_x; a portion of the ammonia will pass through the SCR and will be emitted unaltered, out the stacks. These ammonia emissions are known as ammonia slip. The applicant has committed to an ammonia slip no greater than 5 ppm (SEP2000Dres1). On a daily basis, a 5 ppm slip is equivalent to approximately 600 pounds of ammonia emitted into the atmosphere. In actual operation, staff expects that an ammonia slip concentration of 1 ppm or less for the proposed facility. At this concentration, the ammonia emissions are approximately in the 100 to 200 lbm/day range.

IMPACTS

Air dispersion models provide a means of predicting the location and magnitude of the air contaminant impacts of a new emissions source at ground level. These models consist of several complex series of mathematical equations, which are repeatedly calculated by a computer for many ambient conditions. The model results are often described as a unit of mass per volume of air, such as micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). Each model result provides an estimate of the concentration of the pollutant emitted by the project that will occur at ground level.

The applicant has used an EPA-approved ISCST3 model to estimate the impacts of the project's NO_x, PM₁₀, CO and SO_x emissions resulting from project construction and operation. A description of the modeling analyses and results are provided in Section 8.1.2.3 and Tables 8.1-15 to 8.1-17 of the AFC (SECAL, 2000a). Staff added the applicant's modeled impacts to the available highest ambient background concentrations measured during 1989 to 1999 at the Arkansas Street monitoring station. Staff then compared the results with the ambient air quality standards for each respective air contaminant to determine whether the project's emission impacts would cause a new violation of the ambient air quality standards or contribute to an existing violation.

Inputs for the modeling include stack information (exhaust flow rate, temperature, and stack dimensions), specific turbine emission data and meteorological data, such as wind speed, atmospheric conditions, and site elevation. For this project, the meteorological data used as inputs to the model included hourly wind speeds and directions measured at the project site.

CONSTRUCTION IMPACTS

The results of the project construction impacts analyses are presented in **AIR QUALITY Table 5**. The modeling analyses included both the fugitive dust and vehicle exhaust emissions, which include PM₁₀, NO_x and CO. In **AIR QUALITY Table 5**, the first and second columns list the air contaminant, i.e., NO₂, PM₁₀, and CO, and the averaging time for each air contaminant analyzed. The third and fourth columns present the project emission impacts and the highest measured

concentration of the criteria air contaminants in the ambient air (background), respectively. The fifth column presents the total impact, i.e., the sum of project emission impact and background measured concentration.

As indicated in **Air Quality Table 5**, the project construction activities would further exacerbate existing violations of the state 24-hour PM₁₀ standard, and thus constitute a significant air quality impact on PM₁₀. The project's construction activities would not create a new violation of the either NO₂ or CO air quality standards, thus those impacts are not considered significant.

Staff believes that the PM₁₀ impacts from the construction of the project can be further reduced with the implementation of the staff recommended construction mitigation measures, as discussed in the **Mitigation** section.

AIR QUALITY Table 5
Facility Maximum Construction Impacts

Pollut ants	Av g. Per iod	Impacts ($\mu\text{g}/\text{m}^3$)	Backgrou nd ($\mu\text{g}/\text{m}^3$)	Total Impacts ($\mu\text{g}/\text{m}^3$)	Standards ($\mu\text{g}/\text{m}^3$)	Percent of Standard
NO ₂	1- hr.	302	152	454	470	97%
CO	8- hr.	630	4,610	5,240	10,000	53%
PM ₁₀	24- hr.	27	81	108	50	220%

Source: SECAL, 2001a, AFC Amended page 8.149, Table 8.1-15.

OPERATION IMPACTS

The applicant provided staff with a modeling analysis of the project's operating emissions impacts from directly emitted pollutants, which they believe demonstrates that no violations of ambient air quality standards will be caused by the operation of the project. Staff reviewed the applicant's modeling analysis and concludes that it is adequate.

AIR QUALITY Table 6 presents the results of the modeling analysis using worst case hourly emissions, which include turbine start-up emissions as presented in **AIR QUALITY Table 4**. **AIR QUALITY Table 6** shows that, with the exception of PM₁₀, the project does not cause any new violations of any applicable air quality standard even with worst case ambient concentrations recorded, and thus those impacts are not significant. As for PM₁₀, staff believes that the project itself will contribute to existing violations of the state 24-hour PM₁₀ air quality standard. Therefore, the project's PM₁₀ emission impacts are significant.

CUMULATIVE IMPACTS

Staff's cumulative impact assessment is composed of two types of analyses. The first is an analysis of the project's directly emitted pollutants along with similar emissions from other foreseeable future projects that are currently under construction, or are currently under District review. The second is a discussion of the project's potential contribution to the formation of secondary pollutants, namely ozone and PM₁₀.

AIR QUALITY Table 6
Worst Case Facility Emission Impacts on Ambient Air Quality

Pollutants	Avg. Period	Impacts($\mu\text{g}/\text{m}^3$)	Background ($\mu\text{g}/\text{m}^3$)	Total Impacts ($\mu\text{g}/\text{m}^3$)	Standard ($\mu\text{g}/\text{m}^3$)	Percent of Standard
NO ₂	1-hour	110	152	262	470	56%
	Annual	0.7	39.5	40.2	100	40%
SO ₂	1-hour	8	96	104	655	15%
	24-hour	1.3	21.3	22.6	105	20%
CO	1-hour	520	8,270	8,800	23,000	40%
	8-hour	38	4,610	4,650	10,000	46%
PM ₁₀	24-hour	3	81	84	50	170%
	Annual	0.6	25	26	30	87%

Notes: All short-term (1-hour) ambient air quality impacts have been modeled as the impacts caused by the emissions during start-ups. All long-term (8-hour, 24 hour and annual) impacts are the impacts from the project caused by normal operations.

Source: SEP2000DRes1. Data Responses.

DIRECTLY EMITTED POLLUTANT IMPACTS

To evaluate the direct emission impacts of Unit 7 along with other probable future projects, staff needs specific information that is included when project applicants file an application with the District for a permit. Projects located up to six miles from the proposed facility usually need to be included in the analysis. Staff assumes that impacts from projects beyond six miles would not effect the modeling analysis on a cumulative basis. Staff received information from the District, which indicates that there are four sources that need to be included in the cumulative impact analysis. These sources are the Potrero Units 3-6, Mission Valley Rock, Hunters Point Power Plant, and Southeast Treatment Plant. Note that the Potrero Units 3-6 and the Hunters Point power plants are existing facilities that could potentially increase their power production rates above and beyond their normal operational capacity. Therefore, their potential emission increases will be analyzed for cumulative

impacts to the area. The applicant submitted a cumulative impact analysis for NO₂ and PM₁₀ (SEP2000DRes2), which includes all the aforementioned sources and their emissions. Staff believes that the cumulative impacts for other criteria pollutants such as CO and SO₂ are relatively minor, and therefore has not required such analysis. **AIR QUALITY Table 7** presents the results of the cumulative impacts analysis. The table is organized to show the location of the point where maximum impact is expected. The point of maximum impact is coordinated by the universal transverse mercator (UTM) in the true north and true east directions. The UTM north and east are depicted in the top two rows for each point of maximum impact of the NO₂ 1-hour, annual, and the PM₁₀ 24-hour and annual ambient air quality standards. Subsequent values under each of the air quality standard's column are the impacts from each individual sources (described above) as seen by the model. The sum of each source impact as seen by the model at the point of maximum impact is totaled. This result is added to the background concentration, which then will be compared to the most stringent ambient air quality standard to verify whether significant cumulative impacts could occur from the operation of Unit 7.

AIR QUALITY Table 7
Summary of Cumulative Impacts on the Area

		NO ₂		PM ₁₀	
		1-hour	Annual	24-hour	Annual
Location of maximum impact	UTM North	4,178,300	4,176,817	4,178,795	4,178,847
	UTM East	552,950	555,608	554,599	554,599
Potrero Unit 7 (µg/m ³)		0	0.05	2.50	0.45
Potrero Units 3-6 (µg/m ³)		0	0.15	9.72	1.00
Hunters Point Power Plant (µg/m ³)		125	9.85	0	0.05
Mission Valley Rock (µg/m ³)		0	0.04	0	0.01
SF Southeast Treatment Plant (µg/m ³)		0	0.01	0	0
Cumulative Impacts (µg/m ³)		125	10	12	1.5
Background (µg/m ³)		152	39.5	81	25
Total Cumulative Impacts (µg/m ³)		277	50	93	26
Ambient Air Quality Standards (µg/m ³)		470	100	50	30
Percent of Ambient Air Quality Standards		60%	50%	190%	87%

Source: SEP2000DRes2. December 21, 2000 Response to Data Requests.

As seen from **AIR QUALITY Table 7**, the cumulative impacts of Unit 7 and all other potential sources did not cause any new violation of the 1-hour and annual NO₂ and the annual PM₁₀ standards, and thus those impacts are not significant. The proposed Unit 7 and other potential sources, operating at maximum permitted

emissions, cumulatively add $12 \mu\text{g}/\text{m}^3$ of PM_{10} impact to the existing violation of the state 24-hour PM_{10} standard. Therefore, the proposed project's cumulative PM_{10} impact could be considered to be a significant cumulative impact.

SECONDARY POLLUTANT IMPACTS

OZONE IMPACTS

The proposed project's gaseous emissions, primarily NO_x and VOC, can contribute to the formation of ozone. There are air dispersion models that can be used to quantify ozone impacts, but they are only appropriate for use in regional air quality planning efforts where numerous sources are input into the model to determine the regional ozone impacts. There are no regulatory agency models approved for assessing single source ozone impacts. However, because of the known relationship of NO_x and VOC emissions to ozone formation, staff believes that the emissions of NO_x and VOC from Unit 7 do have the potential to contribute to higher ozone levels if not mitigated. Unit 7 NO_x and VOC contribution to the regional ozone problem is not considered to be significant, because the applicant has proposed to purchase emission reduction credits of NO_x and VOC to fully trade off and mitigate for the emission increases by the proposed facility.

SECONDARY PM_{10} IMPACTS

The project's NO_x , VOC, NH_3 and SO_x emissions can contribute to the formation of secondary PM_{10} , namely organic condensable, nitrates, and sulfates particulate matter.

Not all hydrocarbons can form secondary PM_{10} . Hydrocarbons with six or less carbon atoms in the chain will not participate in the formation of the carbon based PM_{10} . The project's VOC emissions will be in the form of unburned natural gas, which is mostly methane and ethane, which contain only one to two carbon atoms. Thus the turbine exhaust is not expected to emit any significant amount of VOC that can participate in the formation of secondary PM_{10} .

Concerning ammonium nitrate, staff believes that the project's ammonia emissions have a potential to contribute to the ammonium nitrate emissions, which may worsen the violations of the state 24-hour PM_{10} standard. Available research (Spicer, 1982) indicates that the conversion of NO_x to nitrate is approximately between 10 to 30 percent per hour in a polluted urban area where ozone and ammonia are present in sufficient amount to participate in the reaction. Assume a 30 percent NO_x to nitrate conversion rate and a linear extrapolation of the project's PM_{10} modeling results, staff has estimated that the NO_x to nitrate impact from the project can be at a maximum $2 \mu\text{g}/\text{m}^3$. Because the area is non-attainment for the state 24-hr PM_{10} standard, the ammonium nitrate contribution, although small, is significant without providing emission reductions as offsets.

Concerning sulfates as PM_{10} , staff believes that the project will contribute to sulfate levels in the area, although in a very small amount. Currently, there is no agency (EPA or CARB) recommended models or procedures for estimating sulfate

formation. Nevertheless, studies during the past two decades have provided data on the oxidation rates of SO₂. The data from these studies can be used to approximate the conversion of SO₂ to particulate (typically about 0.01 to 1 percent per hour) with Gaussian dispersion models such as ISCST3. The model can be performed with and without chemical conversion (decay factor) and the difference corresponds to the amount of SO₂ that is converted to PM₁₀. Because the project uses natural gas as fuel, very little SO₂ emissions will be emitted; thus the SO₂ to sulfates conversion modeling is not performed or needed. Staff still recommends that offsets, in the form of emission reductions, should be provided to lessen the project's PM₁₀ contribution to the ambient air to a level of insignificance.

VISIBILITY IMPACTS

The applicant has provided, as part of their PSD application to the District, a visibility impact analysis, which shows that the project is not expected to exceed any significant visibility impairment increment inside any nearby (point Reyes National Seashore) PSD Class I areas (SECAL, 2000a). Class I areas are areas of special national or regional value from a natural, scenic, recreational, or historic perspective.

APPLICANT'S PROPOSED MITIGATION

CONSTRUCTION PHASE

The applicant proposes that it would implement Best Available Control Measures (BACM) during construction of the project. These measures are listed below:

- Frequent watering of unpaved roads and disturbed areas (at least twice a day).
- Limit speed of vehicles on the construction areas to no more than 10 MPH.
- Employ tire washing and gravel ramps prior to entering a public roadway to limit accumulated mud and dirt deposited on the roads.
- Treat the entrance roadways to the construction site with soil stabilization compounds.
- Place sandbags adjacent to roadways to prevent run-off to public roadways.
- Install windbreaks at the windward sides of construction areas prior to the soil being disturbed. The windbreaks shall remain in place until the soil is stabilized or permanently covered.
- Employ of dust sweeping vehicles at least twice a day to sweep the public roadways that are used by construction and worker vehicles.
- Sweep newly paved roads at least twice weekly.
- Limit on equipment idle times (no more than five minutes).
- Employ of electric motors for construction equipment when feasible.
- Apply covers or dust suppressants to soil storage piles and disturbed areas that remain inactive over two weeks.
- Pre-wet the soil to be excavated during construction.
- Employ of oxidizing soot filters on all large suitable off-road construction equipment with an engine rating of at least 100 bhp.

In addition, the applicant will maintain the construction emissions so that fugitive emissions will be limited by District rules to a maximum 20 percent opacity during any three minute span. Because the construction emissions are short-term, the applicant has not proposed any emission reduction credits to offset the new emissions.

OPERATION PHASE

The applicant proposes to mitigate the emission increases from the proposed facility using a combination of clean fuel, emission control devices and emission reduction credits. The applicant proposes to use a combination of dry low- NO_x combustion design, Selective Catalytic Reduction (SCR) and high-temperature CO oxidation catalyst technology for each of the combined cycle turbine trains to minimize its NO_x and CO emissions. The proposed control devices are designed to maintain the turbine/duct burner emissions to 2.5 ppm NO_x, 6 ppm CO, and 2 ppm VOC (SECAL 2000a). The ammonia slip emissions (from unreacted ammonia in the SCR) will be maintained at 5 ppm or less. Natural gas will be the only fuel used, which will minimize the project's PM₁₀ and SO_x emissions. Below is a brief description of the emission control technologies that Unit 7 will employ.

DRY LOW- NO_x COMBUSTORS

Over the last 20 years, combustion turbine manufacturers have focused their attention on limiting the NO_x formed during combustion. Because of the expense and efficiency losses due to the use of steam or water injection in the combustor cans to reduce combustion temperatures and the formation of NO_x, CTG manufacturers are presently choosing to limit NO_x formation through the use of dry low- NO_x technologies. In this process, firing temperatures remain somewhat low, thus minimizing NO_x formation, while thermal efficiencies remain high.

FLUE GAS CONTROLS

To further reduce the emissions from the combustion turbines before they are exhausted into the atmosphere, flue gas controls, primarily catalyst systems, will be installed in the HRSG. The applicant is proposing two catalyst systems: a selective catalytic reduction system (SCR) to reduce NO_x, and an oxidizing system to reduce CO and VOC.

SELECTIVE CATALYTIC REDUCTION

Selective catalytic reduction refers to a process that chemically reduces NO_x by injecting ammonia into the flue gas stream, over a catalyst, in the presence of oxygen. The process is termed selective because the ammonia reducing agent preferentially reacts with NO_x rather than oxygen, producing inert nitrogen and water vapor. The performance and effectiveness of SCR systems are related to operating temperatures, which may vary with catalyst designs. Flue gas temperatures from a combustion turbine typically range from 950 to 1100°F.

Catalysts generally operate between 600 to 750°F (ARB 1992), and are normally placed inside the HRSG where the flue gas temperature has cooled. At temperatures lower than 600°F, the ammonia reaction rate may start to decline,

resulting in increasing ammonia emissions, called ammonia slip. At temperatures above about 800°F, depending on the type of material used in the catalyst, damage to some catalysts can occur. The catalyst material most commonly used is titanium dioxide, but materials such as vanadium pentoxide, zeolite, or a noble metal are also used. These newer catalysts (versus the older alumina-based catalysts) are resistant to fuel sulfur fouling at temperatures below 770°F (EPRI 1990).

Regardless of the type of catalyst used, efficient conversion of NO_x to nitrogen and water vapor requires uniform mixing of ammonia into the exhaust gas stream. Also, the catalyst surface has to be large enough to ensure sufficient time for the reaction to take place.

The applicant proposes to use a combination of dry low-NO_x combustor and an SCR system to produce a maximum NO_x concentration exiting the HRSG stack of 2.5 ppm, corrected to 15 percent excess oxygen averaged over a 1-hour period.

OXIDIZING CATALYST

To reduce the turbine CO and VOC emissions, the applicant proposes to install an oxidizing catalyst similar in concept to catalytic converters used in automobiles. The catalyst is usually coated with a rare metal, such as platinum, which will oxidize unburned hydrocarbons and CO to water vapor and carbon dioxide (CO₂). The CO catalyst is proposed to limit the CO concentrations to 6 ppm at 15 percent O₂.

OFFSETS

The proposed facility is required by the BAAQMD to provide offsets on an annual basis (tons per year (tpy)) for NO_x, VOC, and PM₁₀ as shown in **AIR QUALITY Table 8**. The applicant has purchased emission reduction credits, in the form of District issued banking certificates, from sources of offsets located in Antioch, Martinez and San Leandro. The banking certificate #693, in the amount of 473.56 TPY of NO₂, 125.88 TPY of VOC, and 321.9 TPY of SO₂, was issued to Gaylord Container in Antioch for the shut down of boilers at the facility. Certificate # 694, in the amount of 299 TPY of NO₂, 25 TPY of PM₁₀, and 158.2 TPY of SO₂, was issued to PG&E Avon-Martinez facility due to improvement of their equipment at the facility. Certificate #695, in the amount of 1.17 TPY of NO₂, 0.17 TPY of SO₂, and 4.2 TPY of PM₁₀ was issued to Hudson ICS in San Leandro due to improvement of equipment at their facility. In total, as presented in **AIR QUALITY Table 8**, 205 TPY of NO₂, 57 TPY of VOC, 84.5 TPY of PM₁₀ and 78 TPY of SO₂ are dedicated by the applicant to mitigate the potential ozone and PM₁₀ impacts caused by the proposed Unit 7 (SEP2001DRes3).

The applicant has proposed the use of inter-pollutant offsets, i.e., use emission reduction credits of SO₂ to trade for part of the project's PM₁₀ emissions. The applicant has proposed a "3 to 1 ratio", i.e., for every pound of new PM₁₀ emissions from the proposed facility, three pounds of SO₂ are purchased to offset such increase (SEP2001DRes3). The District has accepted the applicant proposed SO₂ to PM₁₀ offset ratio.

AIR QUALITY Table 11
Maximum Annual NO₂, VOC, and PM₁₀ Emissions and Offsets

Pollutant	New Emissions (tpy)	Offset Ratio ¹	Offsets Required (tpy)	Proposed Offsets (tpy)
NO ₂	178	1.15:1	205	205 (Cert. #694-PG&E Martinez/Avon-Martinez)
VOC	49	1:1	57	51 (Cert. #693-Gaylord Container-Antioch) 5.3 (Cert. #694-PG&E Martinez/Avon-Martinez) 0.39 (Cert. #695-Hudson ICS-San Leandro)
PM ₁₀	110	1:1	84.5	53.06 (Cert.#693-Gaylord Container-Antioch) 25 (Cert.#694-PG&E-Avon/Martinez) 6.44 (Cert.#695-Hudson ICS-San Leandro)
		3:1 (SO ₂ : PM ₁₀)	78	78 (Cert.#694 - PG&E-Avon/Martinez)

Notes: 1. Offset ratio as required by the BAAQMD.

ADEQUACY OF PROPOSED MITIGATION MEASURES

CONSTRUCTION PHASE MITIGATION

As mentioned earlier in the impact section, the construction of the project will cause PM₁₀ emissions that will add to the existing violations of the ambient PM₁₀ air quality standard. Therefore, the project PM₁₀ emission impacts due to construction of the project are significant. Staff believes that the implementation of the applicant proposed specific mitigation measures during construction of the facility will reduce the short-term impacts of NO₂ and PM₁₀ to a level of less than significant.

OPERATIONAL PHASE MITIGATION

The project emissions will be fully offset, and will be built using BACT (clean burning using natural gas, SCR and CO oxidation catalyst systems) in accordance with the District NSR. The applicant has proposed an adequate amount of emission reduction credits to offset the facility's new NO_x, VOC, SO₂ and PM₁₀ emissions as required by the District's Rules and Regulations. The project will not cause new violations of any NO₂, SO₂, or CO ambient air quality standards, and therefore, its NO_x, SO_x and CO emission impacts are not significant.

The project, however, will contribute to the occasional existing violations of the 24-hour PM₁₀ air quality standard in the area. The PM₁₀ offset package (84.5 TPY of PM₁₀ and 78 TPY of SO₂ from Antioch and Martinez area) is not likely to effectively mitigate the project's PM₁₀ contributions in the Potrero area, especially during the winter months when the area experiences PM₁₀ violations. Staff reviewed the wind

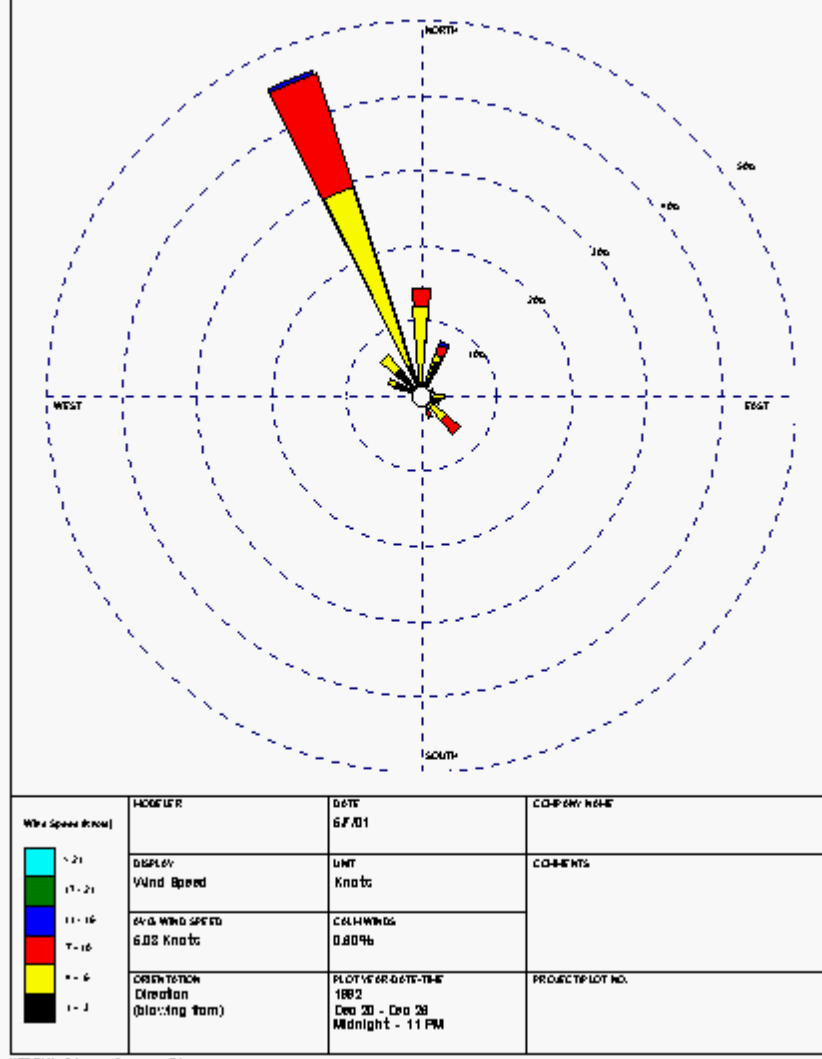
flow pattern (see Air Quality Figure 5) for the seven days when ambient air monitoring station in the area showed that there is a violation of the state 24-hour PM₁₀ standard. The wind flows in this period are blowing from North-Northwest. The offsets mitigation for PM₁₀ provided are from Antioch, which is located 30 miles northeast of the Potrero area. Staff therefore believes that there is a potential that the proposed offsets do not effectively mitigate the direct PM₁₀ emissions from the facility during the time the area may experience a violation of the PM₁₀ standard. Staff recommends that additional direct PM₁₀ emission reduction credits acquired from the Potrero area to be used as mitigation for the project's PM₁₀ emission impacts.

STAFF RECOMMENDED ALTERNATIVE PM₁₀ MITIGATION

A review of the District emission reduction credits bank shows that there is no PM₁₀ credit available in the Potrero area. Staff also conducted a survey for possible sources of PM₁₀ that have potential for further control to mitigate the project PM₁₀ emissions, but found none.

Staff recommends that the applicant contribute monetary funds to the District's "Lower-Emission School Bus Particulate Matter Retrofit Program". This would mitigate the project's direct and secondary PM₁₀ contribution, of approximately 27.5 tons, to the wintertime PM₁₀ problem, which is caused, in large part, by automobiles and trucks.

**AIR QUALITY Figure 5
December 20-26 Wind Flow Pattern**



HOW THE PROGRAM WORKS:

The District is considering approval of approximately \$2.3 million to subsidize the purchase and installation of retrofit devices to reduce the PM₁₀ emissions from diesel school buses. Under this program, any Bay Area public school districts that own and operate school buses can apply for the full cost of a certified retrofitting device that can achieve at least 85 percent PM₁₀ emissions reduction. If interested, a participating school district submits an application to the District to receive a grant for retrofitting the buses. Once the grant is awarded, the school district can order the retrofit devices from qualified vendors. Upon complete installation of the devices, the school district would provide proof of installation, then a reimbursement would be made to the participating school district.

Staff recommends that the applicant contribute a certain amount of money to the District to expand the eligibility of the program, not only to school buses, but to any other private or public parties that operates a diesel fleet. According to the District staff, these operators can include Laidlaw, which leases school buses to the school districts, Muni transit, United Parcel Service and postal services, cement trucks, and Norcal Waste Services. The District staff has indicated that the District is interested in the concept and management of such program, pending approval from the District Government Board.

To generate 27.5 tons of PM₁₀ emission reduction credits, staff has estimated that approximately 125 buses can be retrofitted with the control devices at a cost of \$8,000 per device, installed. This would require the applicant to contribute one million dollars to the District's school bus retrofitting program (see Appendix B for the detailed calculations). Proper implementation of this program will generate enough PM₁₀ emission reduction credits. All of which are in the local area and at the ground level where inhalation is most likely. Thus the generated emission reduction credits will mitigate the project's direct PM₁₀ impacts in the area to a level of less than significant.

COMPLIANCE WITH LORS

FEDERAL

The applicant has submitted to the District an application for the federal PSD permit. The District has issued a Preliminary Determination of Compliance (PDOC) on February 8, 2001, which includes the demonstration of compliance with the federal PSD requirements. Staff has incorporated the District's recommended Conditions into this Preliminary Staff Assessment.

In addition, the applicant is required to submit an application to the District for a significant revision to the existing Major Facility Review Permit (Title V) prior to commencing operation. The applicant is also restricted from commencing operation unless a Title IV Permit has been issued, or 24 months after submitting an acid rain application (Title IV) to the District, whichever is earlier. Compliance with both of these federal titles will be determined at a later date.

STATE

The project, with the anticipated full mitigation (offsets) that will be necessary for the project to secure a Determination of Compliance from the District, will comply with Section 41700 of the California Health and Safety Code. The project will be fully mitigated and therefore would not cause any injury, detriment, nuisance or annoyance to the public.

LOCAL

The District has issued a PDOC (February 8, 2001), which states that the proposed project is expected to comply with all applicable District rules and regulations, and

that offsets will be provided prior to the issuance of the project Authority to Construct permit.

CONCLUSIONS AND RECOMMENDATIONS

Unit 7 emissions of NO_x, SO₂ and CO will not cause a violation of any NO₂, SO₂ or CO ambient air quality standards, and therefore, their impacts are not significant.

The project's air quality impacts from directly emitted PM₁₀ and of the ozone precursor emissions of NO_x and VOC and PM₁₀ precursors of NO_x and SO₂ could be significant if left unmitigated. The applicant will reduce emission to the extent feasible by using Best Available Control Technology, and provide emission offsets for their NO_x, VOC, and PM₁₀ emissions. These mitigation measures satisfy the District requirements and reduce the potential for ozone and secondary PM₁₀ formation to a level of insignificance.

The direct PM₁₀ emission impacts to the local area should also be reduced to a level of less than significant if the applicant provide monetary funds to the District for use in retrofitting existing diesel fueled trucks and buses fleets. Staff recommends the inclusion of Condition of Certification AQC-3 to address the PM₁₀ mitigation program from diesel fueled truck and bus fleets.

The District has provided a Preliminary Determination of Compliance, which staff has incorporated the conclusion and appropriate conditions into the PSA. The District recommended conditions are presented here as Conditions 1 through 47. Staff also recommends the inclusion of two Conditions of Certification AQC-1 and AQC-2 to address the construction-related impacts.

CONDITIONS OF CERTIFICATION

Definitions:

Clock Hour:	Any continuous 60-minute period beginning on the hour.
Calendar Day:	Any continuous 24-hour period beginning at 12:00 AM or 0000 hours.
Year:	Any consecutive twelve-month period of time
Heat Input:	All heat inputs refer to the heat input at the higher heating value (HHV) of the fuel, in Btu/scf.
Rolling 3-hour period:	Any three-hour period that begins on the hour and does not include start-up or shutdown periods.
Firing Hours:	Period of time during which fuel is flowing to a unit, measured in fifteen-minute increments.
MM Btu:	million British thermal units
Gas Turbine Start-up Mode:	The lesser of the first 256 minutes of continuous fuel flow to the Gas Turbine after fuel flow is initiated or the period of time from Gas Turbine fuel flow initiation until the Gas Turbine achieves two consecutive CEM data points in compliance with the emission concentration limits of conditions 27(b) and 27(d).
Gas Turbine Shutdown Mode:	The lesser of the 30 minute period immediately prior to the termination of fuel flow to the Gas Turbine or the period of time from non-compliance with any requirement listed in Conditions 27(b) through 27(d) until termination of fuel flow to the Gas Turbine.
Specified PAHs:	<p>The polycyclic aromatic hydrocarbons listed below shall be considered to Specified PAHs for these permit conditions. Any emission limits for Specified PAHs refer to the sum of the emissions for all six of the following compounds.</p> <p>Benzo[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Dibenzo[a,h]anthracene Indeno[1,2,3-cd]pyrene</p>
Corrected Concentration:	The concentration of any pollutant (generally NO _x , CO, or NH ₃) corrected to a standard stack gas oxygen concentration. For emission point P-55 (combined exhaust of S-55 Gas Turbine and S-56 HRSG duct burners) and emission point P-57 (combined exhaust of S-57 Gas Turbine and S-58 HRSG duct burners) the standard stack gas oxygen concentration is 15% O ₂ by volume on a dry basis.
Commissioning Activities:	All testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the Potrero PP Unit#7 construction contractor to insure safe

	and reliable steady state operation of the gas turbines, heat recovery steam generators, steam turbine, and associated electrical delivery systems.
Commissioning Period:	The Period shall commence when all mechanical, electrical, and control systems are installed and individual system start-up has been completed, or when a gas turbine is first fired, whichever occurs first. The period shall terminate when the plant has completed performance testing, is available for commercial operation, and has initiated sales to the power exchange.
Precursor Organic Compounds (POCs):	Any compound of carbon, excluding methane, ethane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate
CPM:	California Energy Commission Compliance Program Manager
Potrero PP Unit#7:	Potrero Power Plant Unit 7

AQC-1 During construction of this facility, the following fugitive emission control measures shall be implemented at the plant site:

- a. Suspend all land clearing, grading, earth moving, or excavation activities when winds (including instantaneous gusts) exceed 20 miles per hour.
- b. Apply water to active construction sites and unpaved roads at least twice daily to control fugitive dust.
- c. Apply sufficient water or dust suppressants to all material excavated, stockpiled, or graded to prevent fugitive dust from leaving the property boundaries and causing a public nuisance or a violation of an ambient air standard.
- d. Apply a non-toxic solid stabilizer to all inactive construction areas (previously graded areas which remain inactive for 96 hours).
- e. No on-site vehicle shall exceed a speed of 10 miles per hour on unpaved roads or areas.
- f. All trucks hauling dirt, sand, soil, or other loose material will be watered or covered and will maintain at least two feet of freeboard to prevent a public nuisance.
- g. Install wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash off trucks and any equipment leaving the site each trip.
- h. Sweep streets with a water sweeper at the end of each day if visible soil materials are carried onto adjacent public or private paved roads.
- i. Re-establish ground cover on the construction site through seeding and watering as soon as possible, but no later than final occupancy.
- j. Implement all dust control measures in a timely and effective manner during all phases of project development and construction.
- k. Place sandbags adjacent to roadways to prevent run off to public roadways.

- l. Install wind breaks at the windward sides of construction areas prior to the soil being disturbed. The wind breaks shall remain in place until the soil is stabilized or permanently covered.
- m. Limit construction vehicles and equipment idle time to no more than 5 minutes.

Verification: The project owner shall maintain a daily log of water truck activities, including records of the frequency of public road cleaning and area(s) that are covered or treated with dust suppressants. These logs and records shall be available for inspection by the CPM during the construction period. The project owner shall make the construction site available to the District staff and the CPM for inspection and monitoring.

AQC-2 The project owner shall employ the following measures to mitigate, to the extent practical, construction related emission impacts from off-road, diesel-fired construction equipment. These measures include the use of oxidizing soot filters, oxidizing catalysts, diesel fuel certified to CARB low sulfur fuel standards (sulfur content less than 15 ppm) and diesel engines that are either equipped with high pressure fuel injection, employ fuel injection timing retardation or are certified to EPA and CARB 1996 or better off-road equipment emission standards. Additionally, the project owner shall restrict idle time, to the extent practical, to no more than 5 minutes.

The use of each mitigation measure is to be determined by a Qualified Environmental Professional (QEP) or a qualified independent California Licensed Mechanical Engineer (ME). The QEP or ME is to be approved by the CPM prior to the submission of any reports. The QEP or ME will determine the mitigation measures to be used within the following framework.

Construction Mitigation Framework

- 1. No measure or combination of measures shall be allowed to significantly delay the project construction or construction of related linear facilities.
- 2. No measure or combination of measures shall be allowed to cause significant damage to the construction equipment or cause a significant risk to on site workers or the public.
- 3. Engines certified to EPA and CARB 1996 or better off-road equipment emission standards **and** CARB certified ultra low sulfur diesel fuel (15 ppm sulfur content) may be used in lieu of oxidizing soot filter and oxidizing catalyst.

The QEP or ME will, in consultation with the California Air Resources Board (CARB), submit for approval to the CPM a Construction Mitigation Plan, Verification Report and all Reports of Change as necessary, containing at a minimum the following:

Construction Mitigation Plan

The Construction Mitigation Plan shall be submitted to the CPM for approval prior to rough grading breaking ground on the project site and will include:

1. A list of all diesel fuel burning, off-road stationary or portable construction related equipment to be used either on the project construction site or the construction sites of the related linear facilities.
2. All equipment listed under (1), shall be identified as either using engines certified to EPA and CARB 1996 or better off-road equipment emission standards, using diesel engines that are equipped with high pressure fuel injection, or using diesel engines that employ fuel injection timing retardation.
3. The determination of the suitability of all equipment listed under (1) to work appropriately with an oxidizing catalyst shall be identified except as provided for in item 3 of the **Construction Mitigation Framework** above. If a piece of equipment is determined to be unsuitable for an oxidizing catalyst, the QEP or ME will provide an explanation as to the cause of this determination.
4. The determination of the suitability of all equipment listed under (1) to work appropriately with an oxidizing soot filter shall be identified except as provided for in item 3 of the **Construction Mitigation Framework** above. If a piece of equipment is determined to be unsuitable for an oxidizing-soot filter, the QEP or ME will provide an explanation as to the cause of this determination.
5. Maximum idle times shall be identified for all equipment listed under (1).
6. The sulfur content of all diesel fuel to be burned in any equipment listed under (1) shall be identified.

Verification Report

The QEP or ME shall submit a Verification report for approval to the CPM following the initiation of construction activities which contains at a minimum any deviation from the Initial report (above) and the cause, as well as the verification of the Construction Mitigation Plan. Verification shall include, but shall not be limited to, the following:

- 1 EPA or CARB engine certifications for item 2 of the **Construction Mitigation Plan**.
- 2 A copy of the contract agreement requiring subcontractors to comply with the elements under item 2 of the **Construction Mitigation Plan**.
- 3 Confirmation of the installation of either oxidizing catalysts or oxidizing soot filters as identified in items 3 and 4 of the **Construction Mitigation Plan** or the cause preventing the identified installations.
- 4 A copy of the contract agreement requiring subcontractors to comply with the elements under item 5 of the **Construction Mitigation Plan**.
- 5 A copy of receipts of purchase of diesel fuel indicating the sulfur content as identified in item 6 of the **Construction Mitigation Plan**.

Reports of Change

If a specific mitigation measure is determined to be detrimental to a piece of construction equipment or is determined to be causing significant delays in the construction schedule of the project or the associated linear facilities, the mitigation measure may be eliminated or terminated immediately. However notification must be sent to the CPM for approval containing an explanation for the cause of the change. All such causes are restricted to one of the following justifications and must be identified in any Report of Change.

1. The measure is excessively reducing normal availability of the construction equipment due to increased downtime for maintenance, and/or power output due to an excessive increase in back pressure.
2. The measure is causing or reasonably expected to cause significant damage to the construction equipment engine.
3. The measure is causing or reasonably expected to cause a significant risk to nearby workers or the public.
4. Any other seriously detrimental cause which has approval by the CPM prior to the change being implemented.

Verification: The project owner shall submit to the CPM for approval the qualifications of the QEP or ME at least 30 days prior to the due date for the Initial report. The project owner shall submit the Initial report to the CPM for approval 30 calendar days prior to rough grading on the project site. The project owner shall submit the Installation Report to the CPM for approval no later than 10 working days following the use of the specific construction equipment on either the project site or the associated linear facilities. The project owner shall submit any Subsequent reports to the CPM for approval, as required, no later than 10 working days following a change in the status of any identified mitigation measure. The CPM will monitor the approval of all reports submitted by the project owner in consultation with CARB, limiting the review time for any one report to no more than 20 working days.

AQC-3 The project owner shall provide \$1 million to the Bay Area Air Quality Management District (District) to provide PM₁₀ and PM₁₀ precursor reductions in the Potrero/Hunters Point area. The fees shall be provided to the District, who in cooperation with CARB and the California Energy Commission (CEC), will allocate the funds to extend the Lower-Emission School Bus Particulate Matter Retrofit to include commercial and private truck and bus fleet operators in the local area.

Verification: The owner/operator shall provide the funds to the District Air Pollution Control Officer and copies of the payments shall be provided to the CPM 20 days after delivery of the deposit to the District.

CONDITIONS FOR THE COMMISSIONING PERIOD

AQ-1. The owner/operator of the Potrero PP Unit 7 shall minimize emissions of carbon monoxide and nitrogen oxides from S-55 and S-57 Gas Turbines and S-56 and S-58 Heat Recovery Steam Generators (HRSGs) to the maximum extent possible during the commissioning period. Conditions AQ-1 through 12 shall only apply during the commissioning period as defined above. Unless otherwise indicated, Conditions AQ-13 through 47 shall apply after the commissioning period has ended.

Verification: The owner/operator shall submit a monthly compliance report to the CPM. In this report the owner/operator shall indicate how this condition is being implemented.

AQ-2. At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the S-55 & S-57 Gas Turbine combustors and S-56 & S-58 Heat Recovery Steam Generator duct burners shall be tuned to minimize the emissions of carbon monoxide and nitrogen oxides.

Verification: See verification in Condition AQ-1.

AQ-3. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturers and the construction contractor, the A-55 and A-57 SCR Systems and A-56 and A-58 CO Oxidation Catalyst Systems shall be installed, adjusted, and operated to minimize the emissions of carbon monoxide and nitrogen oxides from S-55 & S-57 Gas Turbines and S-56 & S-58 Heat Recovery Steam Generators.

Verification: See verification in Condition AQ-1.

AQ-4. Coincident with the as designed operation of A-55 & A-57 SCR Systems, pursuant to conditions 3, 10, 11, and 12, the Gas Turbines (S-55 & S-57) and the HRSGs (S-56 & S-58) shall comply with the NO_x and CO emission limitations specified in conditions 20(a) through 20(d).

Verification: See verification in Condition AQ-1.

AQ-5. The owner/operator of the Potrero PP Unit#7 shall submit a plan to the District Permit Services Division and the CEC CPM at least four weeks prior to first firing of S-55 or S-57 Gas Turbines describing the procedures to be followed during the commissioning of the gas turbines and HRSGs. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not be limited to, the tuning of the Dry-Low-NO_x combustors, the installation and operation of the SCR systems and oxidation catalysts, the installation, calibration, and testing of the CO and NO_x continuous emission monitors, and any activities requiring the firing of the Gas Turbines (S-55 & S-57) and HRSGs (S-56 & S-58) without abatement by their respective SCR and CO Catalyst Systems.

Verification: See verification in Condition AQ-1.

AQ-6. During the commissioning period, the owner/operator of the Potrero PP Unit#7 shall demonstrate compliance with conditions 8 through 11 through the use of properly operated and maintained continuous emission monitors and data recorders for the following parameters:

- firing hours for each gas turbine and each HRSG
- fuel flow rates to each train
- stack gas nitrogen oxide emission concentrations at P-55 and P-57
- stack gas carbon monoxide emission concentrations P-55 and P-57
- stack gas carbon dioxide concentrations P-55 and P-57

The monitored parameters shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation) for the Gas Turbines (S-55 & S-57) and HRSGs (S-56 & S-58). The owner/operator shall use District-approved methods to calculate heat input rates, NO_x mass emission rates, carbon monoxide mass emission rates, and NO_x and CO emission concentrations, summarized for each clock hour and each calendar day. All records shall be retained on site for at least 5 years from the date of entry and made available to District personnel upon request.

Verification: See verification in Condition AQ-1.

AQ-7. The District-approved continuous emission monitors specified in condition 5 shall be installed, calibrated, and operational prior to first firing of the Gas Turbines (S-55 & S-57) and Heat Recovery Steam Generators (S-56 & S-58). After first firing of the turbines and auxiliary boilers, the detection range of these continuous emission monitors shall be adjusted as necessary to accurately measure the resulting range of CO and NO_x emission concentrations. The type, specifications, and location of these monitors shall be subject to District review and approval.

Verification: See verification in Condition AQ-1.

AQ-8. The total number of firing hours of S-55 Gas Turbine and S-56 Heat Recovery Steam Generator without abatement of nitrogen oxide emissions by A-55 SCR System and/or A-56 Oxidation Catalyst System shall not exceed 500 hours during the commissioning period. Such operation of S-55 Gas Turbine and S-56 HRSG without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR or Oxidation Catalyst Systems fully operational. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 500 firing hours without abatement shall expire.

Verification: See verification in Condition AQ-1.

AQ-9. The total number of firing hours of S-57 Gas Turbine and S-58 Heat Recovery Steam Generator without abatement of nitrogen oxide emissions by A-57 SCR System and/or A-58 Oxidation Catalyst System shall not exceed 500 hours during the commissioning period. Such operation of S-57 Gas Turbine and S-58 HRSG without abatement shall be limited to discrete commissioning activities that can only

be properly executed without the SCR or Oxidation Catalyst Systems fully operational. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 500 firing hours without abatement shall expire.

Verification: See verification in Condition AQ-1.

AQ-10. The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM₁₀, and sulfur dioxide that are emitted by the Gas Turbines (S-55 & S-57) and Heat Recovery Steam Generators (S-56 & S-58) during the commissioning period shall accrue towards the consecutive twelve-month emission limitations specified in condition AQ-24.

Verification: See verification in Condition AQ-1.

AQ-11. Combined pollutant mass emissions from the Gas Turbines (S-55 & S-57) and Heat Recovery Steam Generators (S-56 & S-58) shall not exceed the following limits during the commissioning period. These emission limits shall include emissions resulting from the start-up and shutdown of the Gas Turbines (S-55 & S-57).

NO _x (as NO ₂)	8,428 pounds per calendar day	400 pounds per hour
CO	12,982 pounds per calendar day	584 pounds per hour
POC (as CH ₄)	478 pounds per calendar day	
PM ₁₀	602 pounds per calendar day	
SO ₂	110 pounds per calendar day	

Verification: See verification in Condition AQ-1.

AQ-12. Prior to the end of the Commissioning Period, the Owner/Operator shall conduct a District and CEC approved source test using external continuous emission monitors to determine compliance with condition 20. The source test shall determine NO_x, CO, and POC emissions during start-up and shutdown of the gas turbines. The POC emissions shall be analyzed for methane and ethane to account for the presence of unburned natural gas. The source test shall include a minimum of three start-up and three shutdown periods.

Verification: No later than twenty working days before the commencement of the source tests, the Owner/Operator shall submit to the District and the CPM a detailed source test plan designed to satisfy the requirements of this condition. The District and the CPM will notify the Owner/Operator of any necessary modifications to the plan within 20 working days of receipt of the plan; otherwise, the plan shall be deemed approved. The Owner/Operator shall incorporate the District and CPM comments into the test plan. The Owner/Operator shall notify the District and the CPM within seven (7) working days prior to the planned source testing date. Source test results shall be submitted to the District and the CPM within 30 days of the source testing date.

Conditions for the Gas Turbines (S-55 & S-57) and the Heat Recovery Steam Generators (HRSGs; S-56 & S-58)

AQ-13. The Gas Turbines (S-55 and S-57) and HRSG Duct Burners (S-56 and S-58) shall be fired exclusively on natural gas with a maximum sulfur content of 0.5 grain per 100 standard cubic feet. (BACT for SO₂ and PM₁₀)

Verification: The project owner shall maintain, on a monthly basis, a laboratory analysis showing the sulfur content of natural gas being burned at the facility. The monthly sulfur analysis shall be incorporated into the quarterly compliance reports as required in Condition AQ-14 and its verification.

AQ-14. The combined heat input rate to each power train consisting of a Gas Turbine and its associated HRSG (S-55 & S-56 and S-57 & S-58) shall not exceed 2,249.1 MM Btu per hour, averaged over any rolling 3-hour period. (PSD for NO_x)

Verification: The project owner shall prepare quarterly reports for the preceding calendar quarter by January 30, April 30, July 30, and October 30, and an annual compliance report. These reports shall incorporate all information required and specified in Condition AQ-20 and its verification. The reports shall be submitted to the District and the CPM.

AQ-15. The combined heat input rate to each power train consisting of a Gas Turbine and its associated HRSG (S-55 & S-56 and S-57 & S-58) shall not exceed 53,978.4 MM Btu per calendar day. (PSD for PM₁₀)

Verification: See verification in Condition AQ-14.

AQ-16. The combined cumulative heat input rate for the Gas Turbines (S-55 & S-57) and the HRSGs (S-56 & S-58) shall not exceed 37,960,000 MM Btu per year. (Offsets)

Verification: See verification in Condition AQ-14.

AQ-17. The HRSG duct burners (S-56 and S-58) shall not be fired unless its associated Gas Turbine (S-55 and S-57, respectively) is in operation. (BACT for NO_x)

Verification: As part of the quarterly and annual compliance reports, the owner/operator shall include information on the date, time, and duration of any violation of this permit condition.

AQ-18. Except as provided in Condition No. 8, S-55 Gas Turbine and S-56 HRSG shall be abated by the properly operated and properly maintained A-55 Selective Catalytic Reduction (SCR) System whenever fuel is combusted at those sources and the A-55 catalyst bed has reached minimum operating temperature. (BACT for NO_x)

Verification: As part of the quarterly and annual compliance reports, the owner/operator shall provide information on any major problem in the operation of the Oxidizing Catalyst and Selective Catalytic Reduction Systems for the Gas Turbines and HRSGs. The information shall include, at a minimum, the date and description of the problem and the steps taken to resolve the problem.

AQ-19. Except as provided in Condition AQ-9, S-57 Gas Turbine and S-58 HRSG shall be abated by the properly operated and properly maintained A-57 Selective Catalytic Reduction (SCR) System whenever fuel is combusted at those sources and the A-57 catalyst bed has reached minimum operating temperature. (BACT for NO_x)

Verification: See verification of Condition AQ-18.

AQ-20. The Gas Turbines (S-55 & S-57) and HRSGs (S-56 & S-58) shall comply with requirements (a) through (h) under all operating scenarios, including duct burner firing mode and steam injection power augmentation mode. Requirements (a) through (h) do not apply during a gas turbine start-up or shutdown. (BACT, PSD, and Toxic Risk Management Policy)

- (a) Nitrogen oxide mass emissions (calculated in accordance with District approved methods as NO₂) at P-55 (the combined exhaust point for the S-55 Gas Turbine and the S-56 HRSG after abatement by A-55 SCR System) shall not exceed 20.2 pounds per hour or 0.0090 lb./MM Btu (HHV) of natural gas fired. Nitrogen oxide mass emissions (calculated in accordance with District approved methods as NO₂) at P-57 (the combined exhaust point for the S-57 Gas Turbine and the S-58 HRSG after abatement by A-57 SCR System) shall not exceed 20 pounds per hour or 0.0090 lb./MM Btu (HHV) of natural gas fired. (PSD for NO_x)
- (b) The nitrogen oxide emission concentration at emission points P-55 and P-57 each shall not exceed 2.5 ppmv, on a dry basis, corrected to 15% O₂, averaged over any 1-hour period. (BACT for NO_x)
- (c) Carbon monoxide mass emissions at P-55 and P-57 each shall not exceed 0.013 lb./MM Btu (HHV) of natural gas fired or 29.22 pounds per hour, averaged over any rolling 3-hour period. (PSD for CO)
- (d) The carbon monoxide emission concentration at P-55 and P-57 each shall not exceed 6 ppmv, on a dry basis, corrected to 15% O₂, averaged over any rolling 3-hour period. (BACT for CO)
- (e) Ammonia (NH₃) emission concentrations at P-55 and P-57 each shall not exceed 5 ppmv, on a dry basis, corrected to 15% O₂, averaged over any rolling 3-hour period. This ammonia emission concentration shall be verified by the continuous recording of the ammonia injection rate to A-55 and A-57 SCR Systems. The correlation between the gas turbine and HRSG heat input rates, A-55 and A-57 SCR System ammonia injection rates, and corresponding ammonia emission concentration at emission points P-55 and P-57 shall be determined in accordance with permit condition #29. (TRMP for NH₃)
- (f) Precursor organic compound (POC) mass emissions (as CH₄) at P-55 and P-57 each shall not exceed 5.6 pounds per hour or 0.0025 lb./MM Btu of natural gas fired. (BACT)

- (g) Sulfur dioxide (SO₂) mass emissions at P-55 and P-57 each shall not exceed 3.12 pounds per hour or 0.0014 lb./MM Btu of natural gas fired. (BACT)
- (h) Particulate matter (PM₁₀) mass emissions at P-55 and P-57 each shall not exceed 11 pounds per hour or 0.00592 lb./MM Btu of natural gas fired when the HRSG duct burners are not in operation. Particulate matter (PM₁₀) mass emissions at P-55 and P-57 each shall not exceed 13 pounds per hour or 0.00574 lb./MM Btu of natural gas fired when the HRSG duct burners are in operation. (BACT)

Verification: The project owner shall submit to the District and CPM, via the quarterly and annual compliance reports required by condition AQ-14, the following information. In addition, this information shall be maintained on site for a minimum of five (5) years and shall be provided to District personnel on request.

- a. Operating parameters of emission control equipment, including but not limited to ammonia injection rate, NO_x emission rate and ammonia slip.
- b. Total plant operation time (hours), number of startups, hours in cold startup, hours in warm startup, hours in hot startup, and hours in shutdown.
- c. Date and time of the beginning and end of each startup and shutdown period.
- d. Average plant operation schedule (hours per day, days per week, weeks per year).
- e. All continuous emissions data reduced and reported in accordance with the District approved CEMS protocol.
- f. Maximum hourly, maximum daily, total quarterly, and total calendar year emissions of NO_x, CO, PM₁₀, VOC and SO_x (including calculation protocol).
- g. Fuel sulfur content (monthly laboratory analyses, monthly natural gas sulfur content reports from the natural gas supplier(s), or the results of a custom fuel monitoring schedule approved by the District.
- h. A log of all excess emissions, including the information regarding malfunctions/breakdowns.
- i. Any permanent changes made in the plant process or production, which would affect air pollutant emissions, and indicate when changes were made.
- j. Any maintenance to any air pollutant control system (recorded on an as-performed basis).

AQ-21. The regulated air pollutant mass emission rates from each of the Gas Turbines (S-55 and S-57) during a start-up or a shutdown shall not exceed the limits established below. (PSD)

	Cold Start-Up (lb./event)	Hot Start-Up (lb./event)	Shutdown (lb./event)
Oxides of Nitrogen (as NO _x)	452	189	59
Carbon Monoxide (CO)	990	291	73
Precursor Organic Compounds (as CH ₄)	112	27	6

Verification: See verification of Condition AQ-20.

AQ-22. The Gas Turbines (S-55 and S-57) shall not be in start-up mode simultaneously. (PSD)

Verification: See verification of Condition AQ-20.

AQ-23. Total combined emissions from the Gas Turbines and HRSGs (S-55, S-56, S-57, and S-58), including emissions generated during Gas Turbine start-ups and shutdowns shall not exceed the following limits during any calendar day:

- (a) 2,002 pounds of NO_x (as NO₂) per day (CEQA)
- (b) 3,604 pounds of CO per day (PSD)
- (c) 478 pounds of POC (as CH₄) per day (CEQA)
- (d) 602 pounds of PM₁₀ per day (PSD)
- (e) 110 pounds of SO₂ per day (BACT)

Verification: See verification of Condition AQ-20.

AQ-24. Cumulative combined emissions from the Gas Turbines and HRSGs (S-55, S-56, S-57, and S-58), including emissions generated during gas turbine start-ups and shutdowns shall not exceed the following limits during any consecutive twelve-month period:

- (a) 178.4 tons of NO_x (as NO₂) per year (Offsets, PSD)
- (b) 262.9 tons of CO per year (Cumulative Increase)
- (c) 49.1 tons of POC (as CH₄) per year (Offsets)
- (d) 110.5 tons of PM₁₀ per year (Offsets, PSD)
- (e) 26.2 tons of SO₂ per year (Cumulative Increase)

Verification: See verification of Condition AQ-20.

AQ-25. a. The maximum projected annual toxic air contaminant emissions (per condition 28) from the Gas Turbines and HRSGs combined (S-55, S-56, S-57, and S-58) shall not exceed the following limits:

4,208 pounds of formaldehyde
520 pounds of benzene
41 pounds of Specified polycyclic aromatic hydrocarbons (PAHs) unless the following requirement is satisfied:

The owner/operator shall perform a health risk assessment using the emission rates determined by source test and the most current Bay Area Air Quality Management District approved procedures and unit risk factors in effect at the time of the analysis. This risk analysis shall be submitted to the District and the CPM within 60 days of the source test date. The owner/operator may request that the District and the CPM revise the carcinogenic compound emission limits specified above. If the owner/operator demonstrates to the satisfaction of the APCO that

these revised emission limits will result in a cancer risk of not more than 1.0 in one million, the District and the CPM may, at their discretion, adjust the carcinogenic compound emission limits listed above. (TRMP)

- b. The maximum projected annual Hazardous Air Pollutant (HAP) emissions from the Gas Turbines and HRSGs combined (S-55, S-56, S-57, and S-58) shall not exceed the following limit:

20,000 pounds of hexane per year (US-CAA, Section 112(g))

Conformance with this limit shall be verified by the source testing in condition AQ-32.

Verification: Compliance with condition AQ-28 shall be deemed as compliance with this condition. In addition, approval by the District and the CPM of the reports prepared for condition AQ-28 will constitute a verification of compliance with this condition.

AQ-26. The owner/operator shall demonstrate compliance with conditions AQ-14 through 17, 20(a) through 20(d), 21, 23(a), 23(b), 24(a), and 24(b) by using properly operated and maintained continuous monitors (during all hours of operation including equipment Start-up and Shutdown periods) for all of the following parameters:

- (a) Firing Hours and Fuel Flow Rates for each of the following sources: S-55 & S-56 combined and S-57 & S-58 combined.
- (b) Carbon Dioxide (CO₂) or Oxygen (O₂) concentrations, Nitrogen Oxides (NO_x) concentrations, and Carbon Monoxide (CO) concentrations at each of the following exhaust points: P-55 and P-57.
- (c) Ammonia injection rate at A-55 and A-57 SCR Systems
- (d) Steam injection rate at S-55 & S-57 Gas Turbine Combustors

The owner/operator shall record all of the above parameters every 15 minutes (excluding normal calibration periods) and shall summarize all of the above parameters for each clock hour. For each calendar day, the owner/operator shall calculate and record the total firing hours, the average hourly fuel flow rates, and average hourly pollutant emission concentrations.

The owner/operator shall use the parameters measured above and District-approved calculation methods to calculate the following parameters:

- (e) Heat Input Rate for each of the following sources: S-55 & S-56 combined and S-57 & S-58 combined.
- (f) Corrected NO_x concentrations, NO_x mass emissions (as NO₂), corrected CO concentrations, and CO mass emissions at each of the following exhaust points: P-55 and P-57.

Applicable to emission points P-55 and P-57, the owner/operator shall record the parameters specified in conditions 26(e) and 26(f) at least once every 15 minutes

(excluding normal calibration periods). As specified below, the owner/operator shall calculate and record the following data:

- (g) total Heat Input Rate for every clock hour and the average hourly Heat Input Rate for every rolling 3-hour period.
- (h) on an hourly basis, the cumulative total Heat Input Rate for each calendar day for the following: each Gas Turbine and associated HRSG combined and all four sources (S-55, S-56, S-57, and S-58) combined.
- (i) the average NO_x mass emissions (as NO₂), CO mass emissions, and corrected NO_x and CO emission concentrations for every clock hour and for every rolling 3-hour period.
- (j) on an hourly basis, the cumulative total NO_x mass emissions (as NO₂) and the cumulative total CO mass emissions, for each calendar day for the following: each Gas Turbine and associated HRSG combined, and all four sources (S-55, S-56, S-57, and S-58) combined.
- (k) For each calendar day, the average hourly Heat Input Rates, Corrected NO_x emission concentrations, NO_x mass emissions (as NO₂), corrected CO emission concentrations, and CO mass emissions for each Gas Turbine and associated HRSG combined.
- (l) on a daily basis, the cumulative total NO_x mass emissions (as NO₂) and cumulative total CO mass emissions, for the previous consecutive twelve month period for all four sources (S-55, S-56, S-57, and S-58) combined.

(1-520.1, 9-9-501, BACT, Offsets, NSPS, PSD, Cumulative Increase)

Verification: At least 30 days before the initial operation, the owner/operator shall submit to the CPM a plan on how the measurements and recordings required by this condition will be performed.

AQ-27. To demonstrate compliance with conditions 20(f), 20(g), 20(h), 23(c) through 23(e), and 24(c) through 24(e), the owner/operator shall calculate and record on a daily basis, the Precursor Organic Compound (POC) mass emissions, Fine Particulate Matter (PM₁₀) mass emissions (including condensable particulate matter), and Sulfur Dioxide (SO₂) mass emissions from each power train. The owner/operator shall use the actual Heat Input Rates calculated pursuant to condition 26, actual Gas Turbine Start-up Times, actual Gas Turbine Shutdown Times, and CEC and District-approved emission factors to calculate these emissions. The calculated emissions shall be presented as follows:

- (a) For each calendar day, POC, PM₁₀, and SO₂ emissions shall be summarized for: each power train (Gas Turbine and its respective HRSG combined) and all four sources (S-55, S-56, S-57, and S-58) combined.
- (b) on a daily basis, the 365 day rolling average cumulative total POC, PM₁₀, and SO₂ mass emissions, for all four sources (S-55, S-56, S-57, and S-58) combined. (Offsets, PSD, Cumulative Increase)

Verification: See verification of Condition AQ-20.

AQ-28. To demonstrate compliance with Condition 25, the owner/operator shall calculate and record on an annual basis the maximum projected annual emissions

of: Formaldehyde, Benzene, Specified PAHs and hexane. Maximum projected annual emissions shall be calculated using the maximum Heat Input Rate of 37,960,000 MM Btu/year and the highest emission factor (pounds of pollutant per MM Btu of Heat Input) determined by any source test of the S-55 & S-57 Gas Turbines and/or S-56 & S-58 Heat Recovery Steam Generators. If this calculation method results in an unrealistic mass emission rate (the highest emission factor occurs at a low firing rate) the applicant may use an alternate calculation, subject to District approval. (TRMP)

Verification: See verification of Condition AQ-20.

AQ-29. Within 60 days of start-up of the Potrero PP Unit #7, the owner/operator shall conduct a District-approved source test on exhaust point P-55 or P-57 to determine the corrected ammonia (NH₃) emission concentration to determine compliance with condition 20(e). The source test shall determine the correlation between the heat input rates of the gas turbine and associated HRSG, A-55 or A-57 SCR System ammonia injection rate, and the corresponding NH₃ emission concentration at emission point P-55 or P-57. The source test shall be conducted over the expected operating range of the turbine and HRSG (including, but not limited to minimum, 70%, 85%, and 100% load) to establish the range of ammonia injection rates necessary to achieve NO_x emission reductions while maintaining ammonia slip levels. Continuing compliance with condition 20(e) shall be demonstrated through calculations of corrected ammonia concentrations based upon the source test correlation and continuous records of ammonia injection rate. (TRMP)

Verification: Source test results shall be submitted to the District and the CPM within 60 days of conducting the tests.

AQ-30. Within 60 days of start-up of the Potrero PP Unit #7 and on an annual basis thereafter, the owner/operator shall conduct a District-approved source test on exhaust points P-55 and P-57 while each Gas Turbine and associated Heat Recovery Steam Generator are operating at maximum load (including steam injection power augmentation mode) to determine compliance with Conditions 20(a), (b), (c), (d), (f), (g), and (h), while each Gas Turbine and associated Heat Recovery Steam Generator are operating at minimum load to determine compliance with Conditions 20(c) and (d), and to verify the accuracy of the continuous emission monitors required in condition 26. The owner/operator shall test for (as a minimum): water content, stack gas flow rate, oxygen concentration, precursor organic compound concentration and mass emissions, nitrogen oxide concentration and mass emissions (as NO₂), carbon monoxide concentration and mass emissions, sulfur dioxide concentration and mass emissions, methane, ethane, and particulate matter (PM₁₀) emissions including condensable particulate matter. (BACT, offsets)

Verification: Approval of the source test protocols, as required in condition AQ-31, and the source test reports shall be deemed as verification for this condition. The owner/operator shall notify the District and the CPM within seven (7) working days before the execution of the source tests required in this condition. Source test

results shall be submitted to the District and to the CPM within 60 days of the date of the tests.

AQ-31. The owner/operator shall obtain approval for all source test procedures from the District's Source Test Section and the CPM prior to conducting any tests. The owner/operator shall comply with all applicable testing requirements for continuous emission monitors as specified in Volume V of the District's Manual of Procedures. The owner/operator shall notify the District's Source Test Section and the CPM in writing of the source test protocols and projected test dates at least 7 days prior to the testing date(s). As indicated above, the Owner/Operator shall measure the contribution of condensable PM (back half) to the total PM₁₀ emissions. However, the Owner/Operator may propose alternative measuring techniques to measure condensable PM such as the use of a dilution tunnel or other appropriate method used to capture semi-volatile organic compounds. (BACT)

Verification: Source test results shall be submitted to the District and the CPM within 60 days of conducting the tests.

AQ-32. Within 60 days of start-up of the Potrero PP Unit #7 and on an biennial basis (once every two years) thereafter, the owner/operator shall conduct a District-approved source test on exhaust point P-55 or P-57 while the Gas Turbine and associated Heat Recovery Steam Generator are operating at maximum allowable operating rates to demonstrate compliance with Condition 25. If three consecutive biennial source tests demonstrate that the annual emission rates calculated pursuant to condition 28 for any of the compounds listed below are less than the BAAQMD Toxic Risk Management Policy trigger levels shown, then the owner/operator may discontinue future testing for that pollutant:

Benzene	≤	26.8 pounds/year
Formaldehyde	≤	132 pounds/year
Specified PAHs	≤	0.18 pounds/year
Hexane	≤	20,000 pounds/year
(TRMP)		

Verification: The owner/operator shall notify the District and the CPM within seven (7) working days before the owner/operator plans to conduct source testing as required by this condition. Source test results shall be submitted to the District and the CPM within 60 days of conducting the test.

AQ-33. The owner/operator of the Potrero PP Unit #7 shall submit all reports (including, but not limited to monthly CEM reports, monitor breakdown reports, emission excess reports, equipment breakdown reports, etc.) as required by District Rules or Regulations and in accordance with all procedures and time limits specified in the Rule, Regulation, Manual of Procedures, or Enforcement Division Policies & Procedures Manual. (Regulation 2-6-502)

Verification: See verification of Condition AQ-20.

AQ-34. The owner/operator of the Potrero PP Unit #7 shall maintain all records and reports on site for a minimum of 5 years. These records shall include but are not limited to: continuous monitoring records (firing hours, fuel flows, emission rates, monitor excesses, breakdowns, etc.), source test and analytical records, natural gas sulfur content analysis results, emission calculation records, records of plant upsets and related incidents. The owner/operator shall make all records and reports available to District and the CEC CPM staff upon request. (Regulation 2-6-501)

Verification: During site inspection, the owner/operator shall make all records and reports available to the District, ARB, EPA and CEC staffs.

AQ-35. The owner/operator of the Potrero PP Unit #7 shall notify the District and the CPM of any violations of these permit conditions. Notification shall be submitted in a timely manner, in accordance with all applicable District Rules, Regulations, and the Manual of Procedures. Notwithstanding the notification and reporting requirements given in any District Rule, Regulation, or the Manual of Procedures, the owner/operator shall submit written notification (facsimile is acceptable) to the Enforcement Division within 96 hours of the violation of any permit condition. (Regulation 2-1-403)

Verification: Submittal of these notifications as required by this condition is the verification of these permit conditions. In addition, as part of the quarterly and annual compliance reports of Condition AQ-20, the owner/operator shall include information on the dates when these violations occurred and when the owner/operator notified the District and the CPM.

AQ-36. The stack height of emission points P-55 and P-57 shall each be at least 180 feet above grade level at the stack base. (PSD, TRMP)

Verification: 120 days prior to start of construction, the project owner/operator shall provide the District and CPM an "approved for construction" drawing showing the appropriate stack height and location of sampling ports and platforms. The project owner/operator shall make the site available to the District, EPA and CEC staff for inspection.

AQ-37. The Owner/Operator of Potrero PP Unit #7 shall provide adequate stack sampling ports and platforms to enable the performance of source testing. The location and configuration of the stack sampling ports shall be subject to BAAQMD review and approval. (Regulation 1-501)

Verification: See verification of Condition AQ-36.

AQ-38. Within 180 days of the issuance of the Authority to Construct for the Potrero PP Unit #7, the Owner/Operator shall contact the BAAQMD Technical Services Division regarding requirements for the continuous monitors, sampling ports, platforms, and source tests required by conditions 26, 29, 30 and 32. All source testing and monitoring shall be conducted in accordance with the BAAQMD Manual of Procedures. (Regulation 1-501)

Verification: The project owner/operator shall notify the CPM within 7 days of receiving the District's approval for the source testing and monitoring plan.

AQ-39. Prior to the issuance of the BAAQMD Authority to Construct for the Potrero PP Unit #7, the Owner/Operator shall demonstrate that valid emission reduction credits in the amount of 205.2 tons/year of Nitrogen Oxides, 56.5 tons/year of Precursor Organic Compounds or equivalent (as defined by District Regulations 2-2-302.1 and 2-2-302.2), and 110.5 tons of Particulate Matter less than 10 microns are under their control through enforceable contracts, option to purchase agreements, or equivalent binding legal documents. (Offsets)

Verification: Prior to the issuance of an Authority to Construct, the Owner/Operator shall provide copies of all emission reduction credits certificates to the District and the CPM.

AQ-40. Prior to the start of construction of the Potrero PP Unit #7, the Owner/Operator shall provide to the District valid emission reduction credit banking certificates in the amount of 205.2 tons/year of Nitrogen Oxides, 56.5 tons/year of Precursor Organic Compounds or equivalent as defined by District Regulations 2-2-302.1 and 2-2-302.2 and 110.5 tons of Particulate Matter less than 10 microns. (Offsets)

Verification: See verification of Condition AQ-39.

AQ-41. Pursuant to BAAQMD Regulation 2, Rule 6, section 404.1, the owner/operator of the Potrero PP Unit #7 shall submit an application to the BAAQMD for a major facility review permit within 12 months of the issuance of the PSD Permit. (Regulation 2-6-404.1)

Verification: The owner/operator shall submit to the CPM copies of the Federal (Title IV) Acid Rain and (Title V) Operating Permit within 30 days after they are issued by the District.

AQ-42. Pursuant to 40 CFR Part 72.30(b)(2)(ii) of the Federal Acid Rain Program, the owner/operator of the Potrero PP Unit #7 shall not operate either of the gas turbines until either: 1) a Title IV Operating Permit has been issued; 2) 24 months after a Title IV Operating Permit Application has been submitted, whichever is earlier. (Regulation 2, Rule 7)

Verification: See verification of Condition AQ-41.

AQ-43. The Potrero PP Unit #7 shall comply with the continuous emission monitoring requirements of 40 CFR Part 75. (Regulation 2, Rule 7)

Verification: At least 45 days prior to commencement of construction, the project owner/operator shall seek approval from the District for an emission monitoring plan.

AQ-44. The owner/operator shall take monthly samples of the natural gas combusted at the Potrero PP Unit #7. The samples shall be analyzed for sulfur content using District-approved laboratory methods or the owner/operator shall obtain certified analytical results from the gas supplier. The sulfur content test results shall be retained on site for a minimum of five years from the test date and shall be utilized to satisfy the requirements of 40 CFR Part 60, subpart GG. If the results from six consecutive monthly samples show results below 0.5 grains per 100 scf, the owner/operator may discontinue the sampling program with District approval. (cumulative increase)

Verification: See verification of Condition AQ-19.

REFERENCES

SECAL (Southern Energy California). 2000a. Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, May 31, 2000.

SECAL (Southern Energy California). 2000b. Supplemental Information in Response to CEC Data Adequacy Request, Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, August 31, 2000.

SECAL (Southern Energy California). 2001a. Amendment to the Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Addresses the demolition of six existing structures. Submitted to the California Energy Commission, January 19, 2001.

SECAL (Southern Energy California). 2001b. Amendment to the Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Addresses data responses to staff's Data Requests 30 – 32 (Cultural Resources), revises AFC Section 8.3, Cultural Resources, and AFC Appendix R, Cultural Resources. Submitted to the California Energy Commission, January 31, 2001.

BAAQMD (Bay Area Air Quality Management District), 2000. Bay Area 2000 Clean Air Plan. December 20, 2000.

DATA RESPONSES

SECAL (Southern Energy California). SEP2000DRes1. Southern Energy California response to staff Data Requests, Set 1, Nos. 1 through 139, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission on December 7, 2000.

SECAL (Southern Energy California). SEP2000DRes2. Southern Energy California response to staff Data Requests, Set 2, Nos. 140 through 161, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission December 21, 2000.

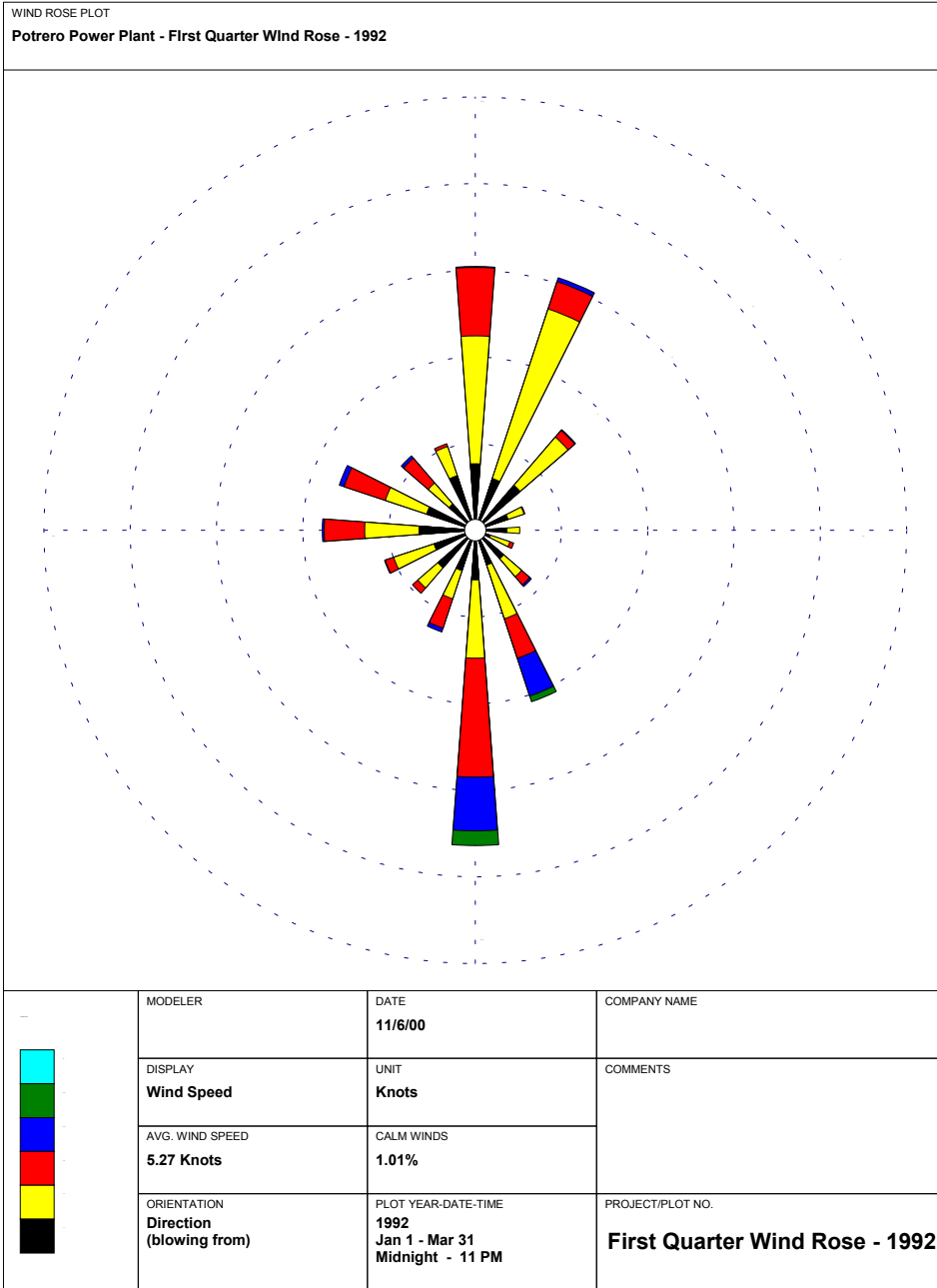
SECAL (Southern Energy California). SEP2001DRes3. Southern Energy California response to staff Data Requests, Set 3, Nos. 162 through 169, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission January 29, 2001.

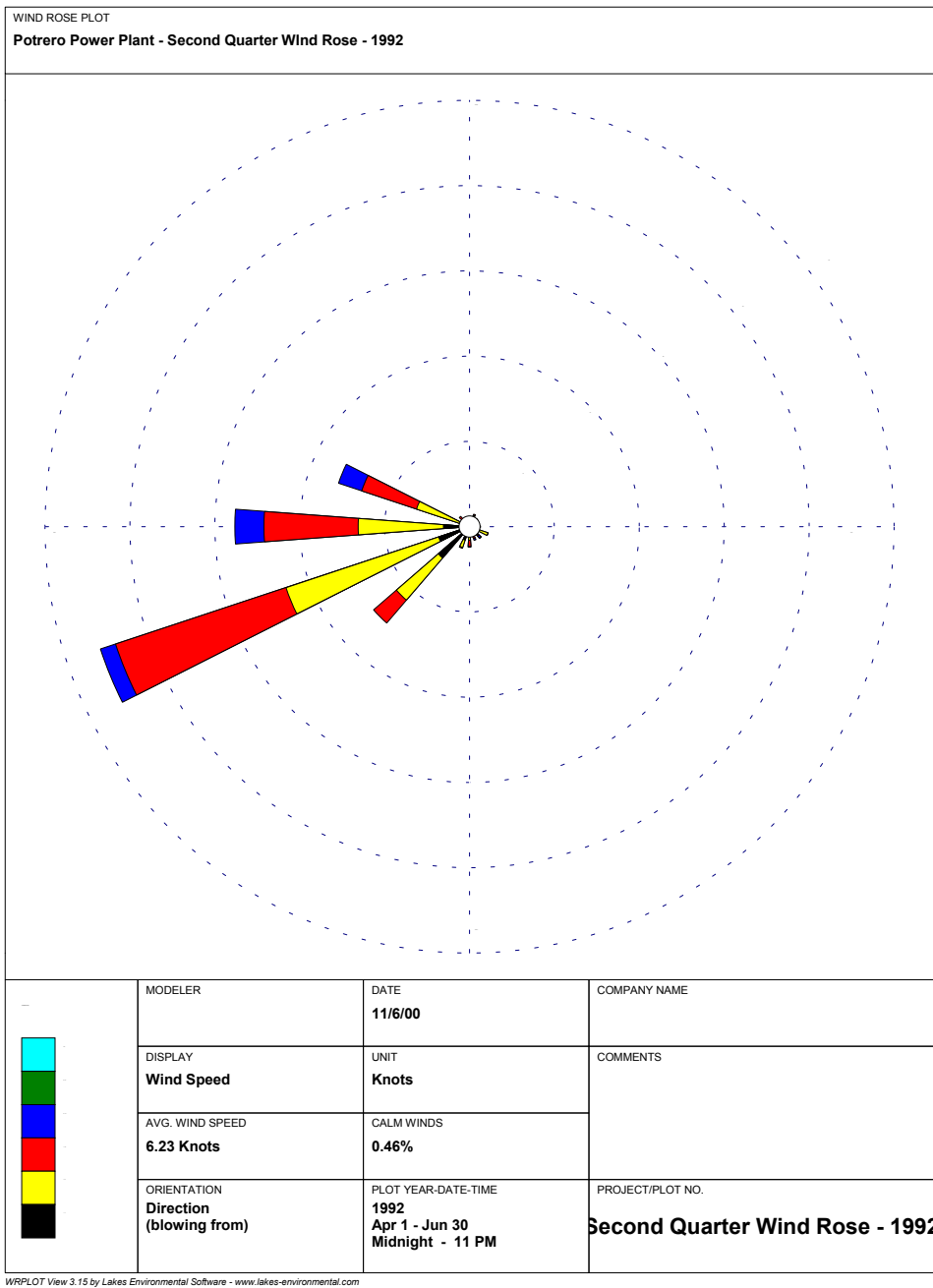
Mirant (Mirant Corporation). Mirant2001DResSAEJ. Mirant responses to Southeast Alliance for Environmental Justice, Data Requests, Set 1, Nos. 1 through 155,

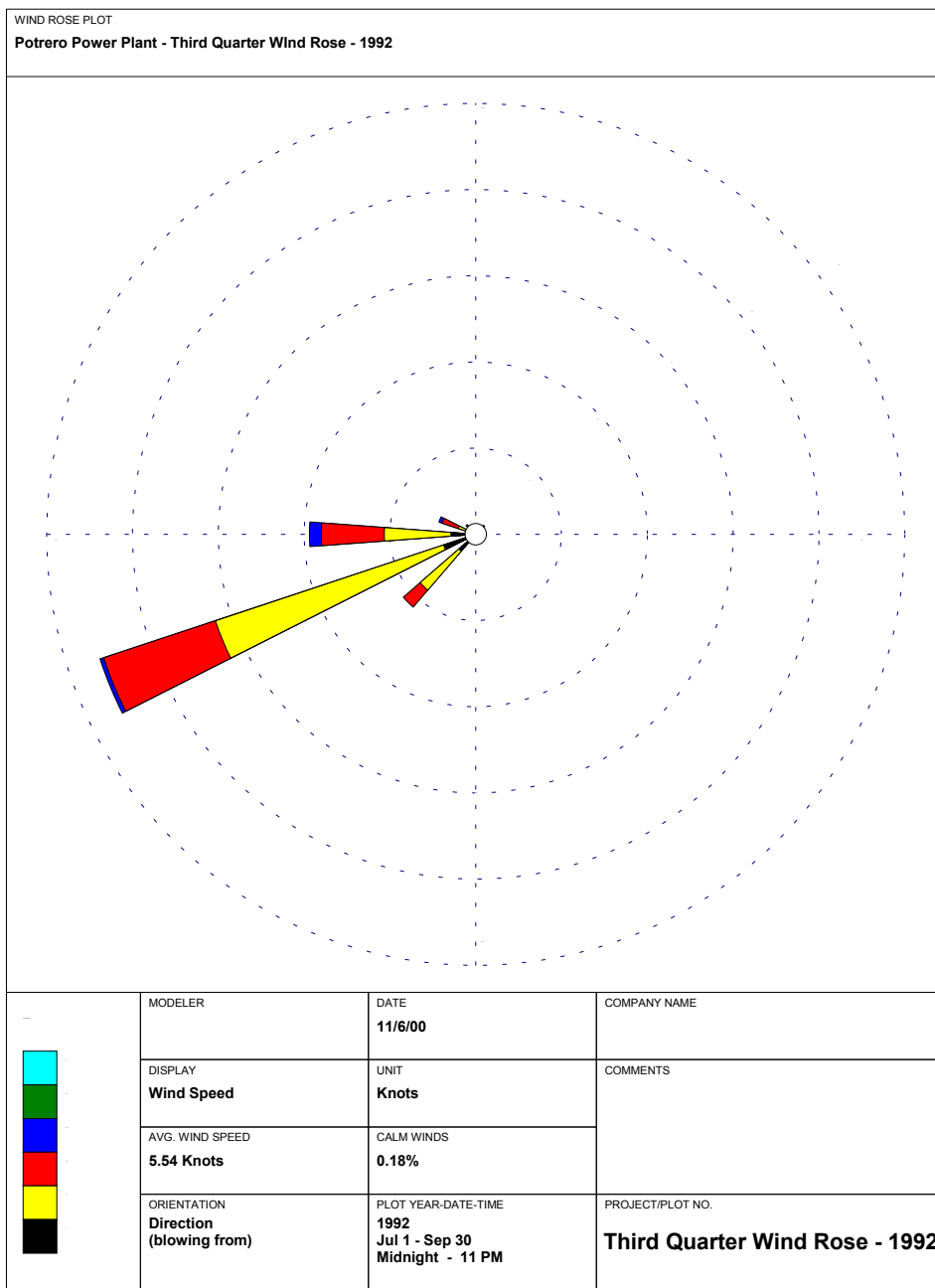
Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission February 27, 2001.

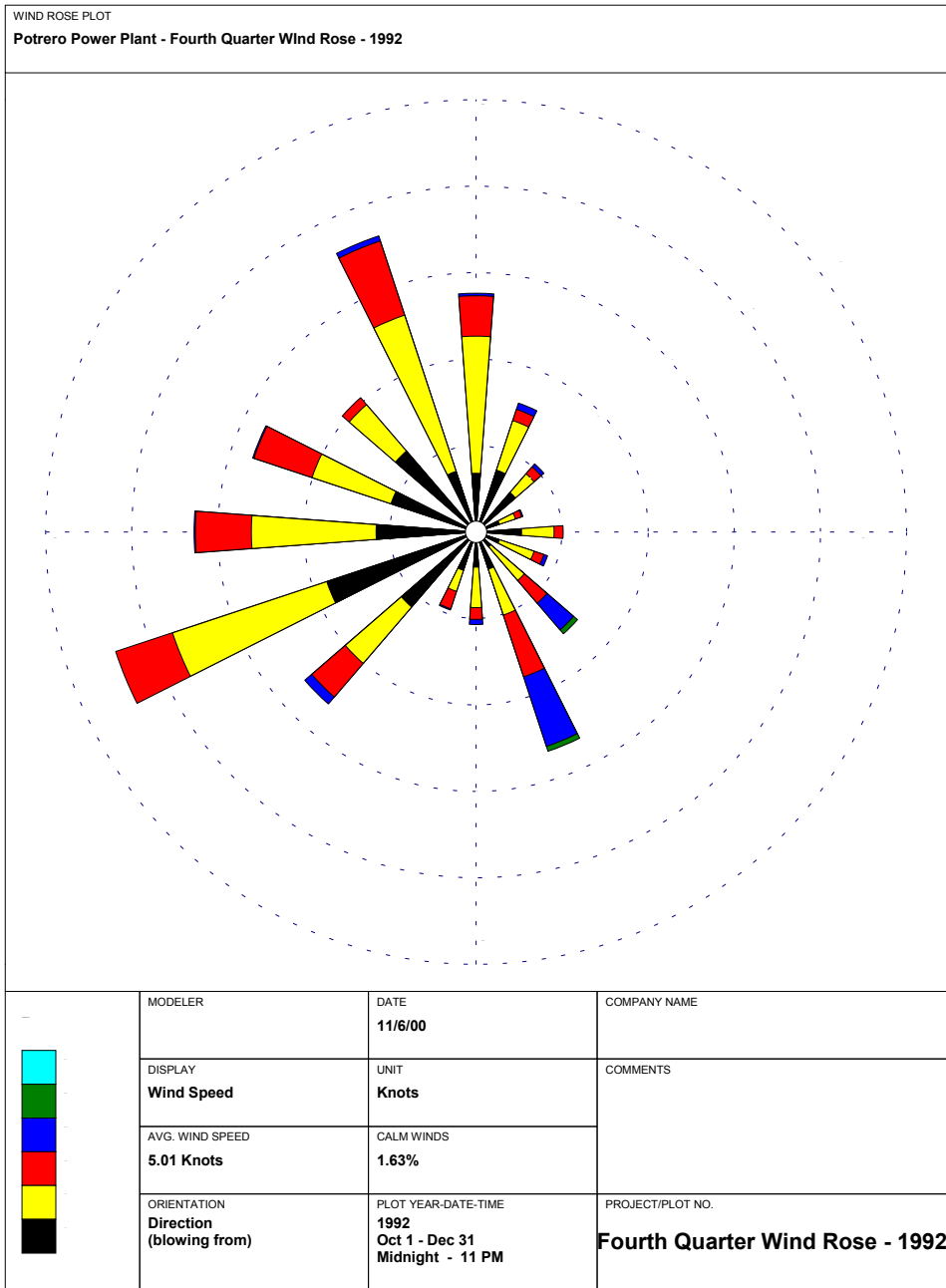
APPENDIX A

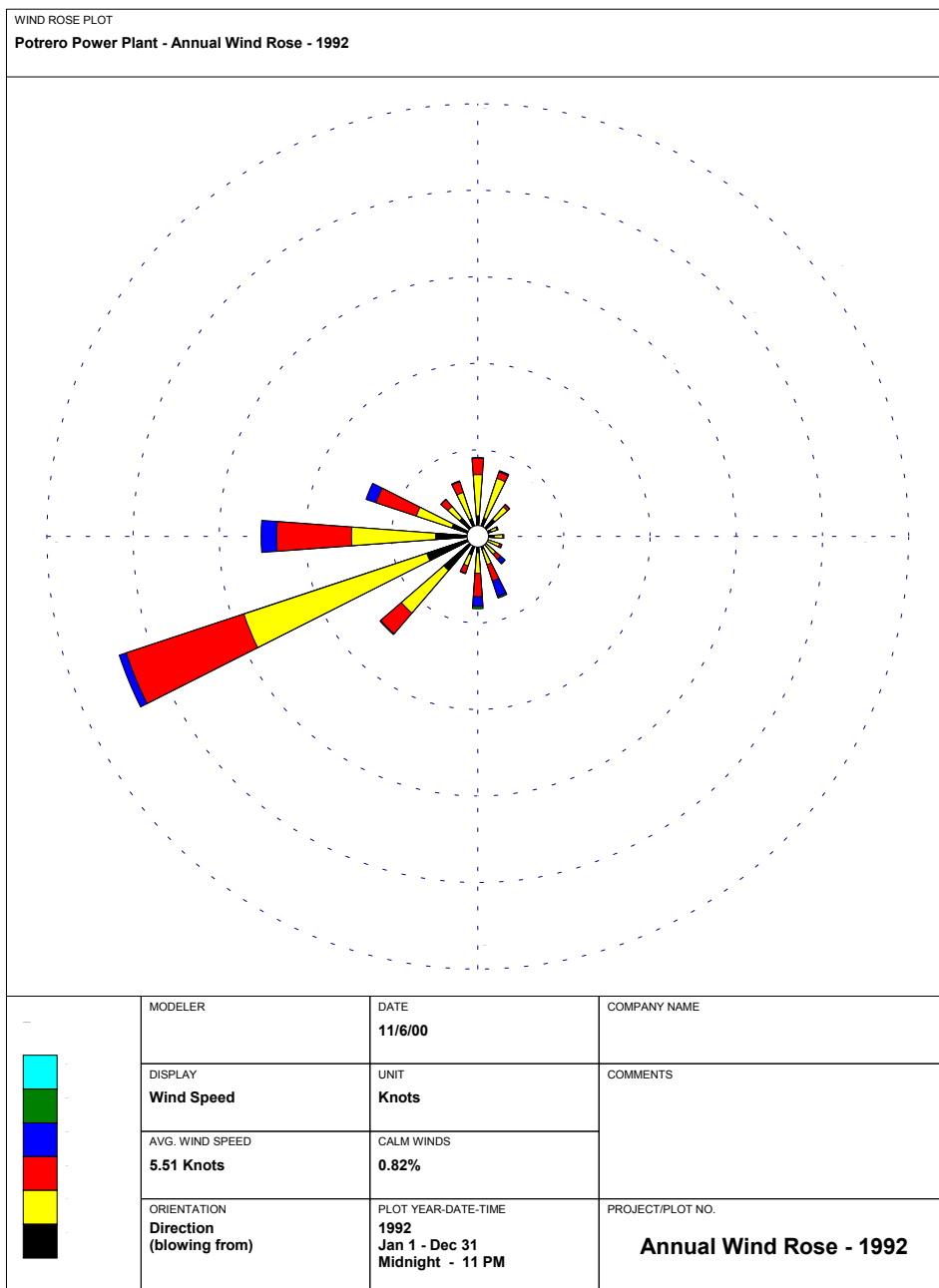
WIND ROSE DATA











WRPLOT View 3.15 by Lakes Environmental Software - www.lakes-environmental.com

APPENDIX B

PROPOSED LOWER EMISSIONS SCHOOL BUS RETROFITTING PROGRAM

THE PROJECT

Potrero Unit 7 is a proposed nominal 540 megawatt natural gas-fired, combined-cycle power plant comprised combustion turbines, one steam turbine, and supporting equipment. The project is expected to emit 110 tons per year of particulate matter (PM₁₀), which could create significant adverse impacts. Staff is investigating all feasible means of reducing any impacts to a level of insignificance.

THE PROBLEM

The area experiences numerous violations of the state PM₁₀ ambient air quality standards. From 1990 through 1999 the data show that PM₁₀ violations occurred primarily between the months of October through December when the weather is cold. The area PM₁₀ violations typically caused by wood smoke, combustion of fossil fuels, and airborne entrained dust from motor vehicles, and construction activities (Bay Area 2000 Clean Air Plan). In addition, the area experiences a lower levels of solar radiation, which leads to stronger temperature inversions that are conducive to the buildup of PM₁₀ near ground level, which in turn contributes to the violations of the PM₁₀ air quality standard.

To mitigate the project's PM₁₀ emission impacts, staff recommends that the applicant contribute one million dollar into the District proposed "Lower Emission School Bus Particulate Matter Retrofit Program" to help funding the reimbursement of retrofitting school buses with PM₁₀ control devices.

HOW THE PROGRAM WORKS:

Basically, any interested public school that owns and operates 1977 or newer model school buses can apply to the BAAQMD for reimbursement the total cost for retrofitting those buses with PM₁₀ control devices. The control devices must be pre-certified by the Air Resources Board that they would reduce the PM₁₀ emissions by 85 percent.

The school districts must submit an application to the BAAQMD by August 15, 2001 for the funding of the retrofitting program. Once the grant is awarded, the school district can start order equipment and rearrange for installation. Once the installation is completed, the school district will provide the BAAQMD a proof of installation, after which the school district will be reimbursed. Currently, the BAAQMD has considered approval of \$2.3 million for the program, which shall be on a first come, first serve basis.

- Staff suggests that the applicant contribute one million dollars to the BAAQMD school bus retrofitting program.

HOW STAFF ARRIVED AT THE SUGGESTED FUND CONTRIBUTION

Criteria: To achieve a total of 27.5 tons of PM₁₀ emission reductions that could mitigate the project direct PM₁₀ emission contribution to the area for one calendar quarter.

Known data

1. Current PM₁₀ emissions for diesel buses = 0.8 g/hp-hr (Control of Emissions of Air Pollution from Highway Heavy-Duty Engines)
2. Each bus engine would average about 275 hp (assumed by staff)
3. Each bus would run approximately 4 hrs/day and 270 days per year (assumed by staff)
4. Each control device will achieve 85 percent PM₁₀ reduction (BAAQMD Lower Emission School Bus Particulate Matter Retrofit Program)
5. Each device including installation would cost \$8,000

Calculations:

- Current school bus PM₁₀ emissions:

$$\frac{0.8g}{hp-hr} * \frac{275hp}{bus} * \frac{lbm}{453.6g} * 4hr/d * \frac{270d}{yr} = 524 \frac{lbs}{bus}$$

- Emissions reduction after retrofit:

$$\Delta \dot{E} = 524lb / bus * (0.85) = \frac{445lbsPM_{10}}{bus}$$

- Numbers of unit needed:

$$27.5tons * \frac{2000lb}{ton} * \frac{bus}{445lbPM_{10}} = 125buses$$

- Cost @ \$8,000/bus

$$125buses * \$8,000 = \$1,000,000$$

AQUATIC BIOLOGICAL RESOURCES

Dr. Noel Davis, Dr. Mike Foster and Rick York

INTRODUCTION

This section provides the Energy Commission's Preliminary Staff Analysis (PSA) of potential impacts to aquatic biological resources from the construction and operation of the Potrero Power Plant Unit 7 Project (Unit 7) proposed by Mirant California, LLC (Mirant). This analysis addresses potential impacts to state and federally listed species, species of special concern, and areas of critical biological concern. This document presents information regarding the affected biotic community and the potential environmental impacts associated with the construction and operation of the proposed project. Impacts to biological resources may be directly associated with structures or actions undertaken as part of the proposed project or indirectly as they may affect the physical environment, which in turn, negatively affects habitat conditions for sensitive species. Impacts to biological resources that are similar in nature to existing or foreseeable future projects in the area are addressed in the Cumulative Impacts section.

This analysis is based, in part, upon information provided in the Application for Certification (AFC) for the Potrero Power Plant Unit 7 Project (SECAL, 2000a, AFC Section 8.2 and Appendices G and H), Supplemental Information to the AFC (SECAL 2000b), reports on biological surveys offshore the Potrero Power Plant by the Applicant's consultants (MIRANT2001BioSamp1, (MIRANT2001BioSamp2, MIRANT2001BioSamp3), various responses to staff data requests, workshops, site visits and discussions with various agency representatives.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

SECTION 10 OF THE RIVERS AND HARBORS ACT OF 1899 (33 U.S.C. 403)

This law prohibits the unauthorized obstruction or alteration of any navigable water of the United States. This section provides that the construction of any structure in or over any navigable water of the United States, or the accomplishment of any other work affecting the course, location, condition, or physical capacity of such waters is unlawful unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of the Army. The Secretary's approval authority has since been delegated to the Chief of Engineers.

ENDANGERED SPECIES ACT OF 1973 (16 U.S.C. 1531 ET SEQ.)

This act provides for protection of threatened and endangered plant and animal species, and their critical habitat. The administering agency is the U. S. Fish and Wildlife Service (USFWS).

MIGRATORY BIRD TREATY ACT (16 U.S.C. 703 ET SEQ.)

This act prohibits the take of migratory birds, including nests with viable eggs. The administering agency is the USFWS.

CLEAN WATER ACT (33 U.S.C. 404 ET SEQ.)

The act prohibits the discharge of dredged or fill material in to the waters of the United States without a permit. Nationwide permit (NWP) 7 is required to construct an outfall structure and the effluent is authorized under the National Pollution Discharge Elimination System program (Section 402). The administering agencies are the U.S. Army Corps of Engineers (Corps) and the Regional Water Quality Control Board (RWQCB).

LONG-TERM MANAGEMENT STRATEGY (LTMS) FOR THE PLACEMENT OF DREDGED MATERIAL IN THE SAN FRANCISCO BAY REGION, VOLUME I. POLICY EIS/PROGRAMMATIC EIR

The disposal of dredged material should comply with the policies, goals and measures set forth by the U.S. Environmental Protection Agency and U.S. Army Corps of Engineers in this document to avoid impacts to biological resources. The administering agencies are the Army Corps of Engineers (USACE) and the Environmental Protection Agency (USEPA).

MARINE MAMMAL PROTECTION ACT (16 U.S.C. 1361 ET SEQ.)

This act provides protection for marine mammals.

MAGNUSON-STEVENS FISHERY MANAGEMENT AND CONSERVATION ACT, AS AMENDED (16 U.S.C. 1801 ET SEQ.)

The 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act set forth a number of new mandates for the National Marine Fisheries Service (NMFS), regional fishery management councils, and other federal agencies to identify and protect important marine and anadromous fish habitat. The Councils, with assistance from NMFS, are required to delineate “essential fish habitat” (EFH) for all managed species. The Act defines EFH as “... those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” Federal action agencies which fund, permit, or carry out activities that may adversely impact EFH are required to consult with NMFS regarding the potential effects of their actions on EFH, and respond in writing to the fishery service’s recommendations. For the Pacific region, EFH has been identified for a total of 89 species covered by three fishery management plans (FMPs) under the auspices of the Pacific Fishery Management Council.

STATE

CALIFORNIA ENDANGERED SPECIES ACT OF 1984

Fish and Game Code sections 2050 et seq. protects California’s rare, threatened, and endangered species. Designated species are protected by regulation (See Cal. Code Regs., Tit. 14, Sections 670.2 and 670.5).

NEST OR EGGS – TAKE, POSSESS, OR DESTROY

Fish and Game Code section 3503 protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs or any bird.

BIRDS OF PREY OR EGGS – TAKE, POSSESS, OR DESTROY

Fish and Game Code section 3503.5 protects California's birds of prey and their eggs by making it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird.

MIGRATORY BIRDS – TAKE OR POSSESSION

Fish and Game Code section 3513 protects California's migratory birds by making it unlawful to take or possess any migratory non-game bird as designated in the Migratory Bird Treaty Act or any part of such migratory non-game bird.

FULLY PROTECTED SPECIES

Fish and Game Code sections 3511, 4700, 5050, and 5515 prohibits take of animals that are classified as Fully Protected in California.

SIGNIFICANT NATURAL AREAS

Fish and Game Code section 1930 et seq. designates certain areas such as refuges, natural sloughs, riparian areas and vernal pools as significant wildlife habitat.

STREAMBED ALTERATION AGREEMENT

Fish and Game Code section 1601 et seq. regulates activities by public utilities that may divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake designated by the department in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit. A permit may be required from the CDFG for directional boring of Islais Creek; however, because the Creek is cut off upstream from the boring site and is no longer a fresh water flowing water body, this section may not be applicable (Scott Wilson, personal communication, 2001).

McATEER-PETRIS ACT

This act established the San Francisco Bay Plan for the protection of the Bay and its natural resources and the development of the Bay and shoreline to their highest potential with a minimum of Bay fill. This Act established the San Francisco Bay Conservation and Development Commission (BCDC) as the agency responsible for maintaining and carrying out the provisions of the Act. The Act directs the BCDC to exercise its authority to issue or deny permit applications for placing or extracting materials, or changing the use of any land, water, or structure within the area of its jurisdiction, in conformity with the provisions and policies of both the McAteer-Petris Act and the San Francisco Bay Plan. The San Francisco Bay Plan establishes the following policies related to fish and wildlife:

POLICY 1

The benefits of fish and wildlife should be insured for present and future generations of Californians. Therefore, to the greatest extent feasible, the remaining marshes and mudflats around the Bay, the remaining water volume and surface area of the Bay, and the adequate fresh water inflow into the Bay should be maintained.

POLICY 2

Specific habitats that are needed to prevent the extinction of any species, or to maintain or increase any species that would provide substantial public benefits, should be protected, whether in the Bay or on the shoreline behind dikes.

LOCAL

CITY AND COUNTY OF SAN FRANCISCO MASTER PLAN, ENVIRONMENTAL PROTECTION ELEMENT

The City and County of San Francisco has established an objective to maintain and improve the quality of the Bay, ocean and shoreline areas. The City and County of San Francisco Master Plan, Environmental Protection Element recognizes that protecting and enhancing the many values of these resources requires ending pollution of the Bay and Ocean, closely controlling commercial uses of the water and shorelines, preserving and adding to the recreational frontage along the water, and protecting and improving the existing recreational frontage.

OBJECTIVE 3 POLICY 1

Cooperate with and otherwise support regulatory programs of existing regional, State and Federal agencies dealing with the Bay, Ocean, and Shorelines

OBJECTIVE 3 POLICY 2

Promote the use and development of shoreline areas consistent with the Comprehensive Plan and best interest of San Francisco.

OBJECTIVE 3 POLICY 3

Implement plans to improve sewage treatment and halt pollution of the Bay and ocean.

OBJECTIVE 3 POLICY 4

Encourage and assist privately operated programs to conserve the resources of the Bay, Ocean, and Shorelines.

SUSTAINABILITY PLAN FOR THE CITY AND COUNTY OF SAN FRANCISCO

This advisory document was adopted by the City and County of San Francisco in 1997 and provides goals, objectives and actions for restoring and maintaining biodiversity.

SETTING

MARINE HABITATS

The Potrero Power Plant (Potrero PP) is located along the western shore of central San Francisco Bay in the City and County of San Francisco, California. San Francisco Bay estuary is the largest coastal embayment on the Pacific coast of the United States. The protected waters of San Francisco Bay provide habitat for a wide variety of aquatic species, including migratory and resident water birds and anadromous fishes. San Francisco Bay has two distinct estuarine reaches, the northern reach and the southern reach. The northern reach is dominated by seasonally variable flow from the Sacramento River (Davis 1982). The southern reach, or South Bay, receives only minor amounts of freshwater flow and is a tidally oscillating lagoon type estuary (Monroe and Kelly 1992). Central Bay, between the two reaches, is more oceanic in character because of the large influx of ocean water through the Golden Gate (Davis 1982).

The Potrero PP site is within a complex of shipping terminals. The shoreline in the vicinity of the Potrero PP has been modified by the construction of piers, wharves, bulkheads, and landfill. Much of the shoreline in the area has been stabilized with rip rap and broken concrete. At the power plant, the rip rapped shoreline immediately grades into softer sediments of sand and mud in the adjacent offshore subtidal areas.

The applicant's marine biological consultant, Tenera Environmental Services (MIRANT2001BioSamp3, pages 3-1 to 3-10) surveyed the rocky intertidal community in the vicinity of Potrero PP in February 2001. All areas surveyed were characterized by a low diversity of algae and invertebrates. Sessile invertebrates included barnacles (primarily *Balanus* spp.), the rock jingle (*Pododesmus cepio*), and the bay mussel (*Mytilus galloprovincialis*). Shorecrabs (*Pachygrapsus* sp. and *Hemigrapsus* sp.) were occasionally observed underneath cobbles. Common species of algae included the rockweed *Fucus gardneri*, green algae (*Ulva* spp. and *Enteromorpha* sp.) and three species of red algae (*Ceramium* sp., *Mastocarpus papillatus* and *Gelidium coulteri*). Although the diversity of algae was low, abundance was high.

The substrate of the subtidal zone in the vicinity of the Potrero PP consists of gravel, shell debris, sand, and mud. Recent grab samples of the bay bottom in the vicinity of Potrero PP showed that sediments in the vicinity of the power plant are comprised primarily of silt sized particles (MIRANT2001BioSamp3, page 2-8). Near the bay channel where tidal currents prevent settlement and deposition of fine sediments, medium to coarse-grained sand occurs.

The soft bottom supports infaunal invertebrates that live within the sand and epifaunal invertebrates that live on top of the sand. A total of 145 taxa of infaunal invertebrates were identified from the recent grab samples near Potrero PP (MIRANT2001BioSamp3, page 2-3). The most abundant taxa were the tube building amphipod *Ampelisca abdita*, the polychaete worm *Exogone lourei*, and

oligochaete worms of the family Tubificidae. Table 1 lists the ten most abundant infaunal species collected in the vicinity of the Potrero PP. In general, the infaunal invertebrate community near the Potrero PP was characteristic of the Central Bay muddy sub-assemblage described by Thompson et al (1999) as characteristic of fine grained substrate in Central San Francisco Bay.

Biological Resources Table 1. Most Abundant Infaunal Species Collected Near Potrero PP in December 2000 (MIRANT2001BioSamp3, page 2-5)

<u>Phylum</u>	<u>Species</u>	<u>Percent Abundance</u>
Arthropoda	<i>Ampelisca abdita</i>	14.3%
Annelida	<i>Exogone lourei</i>	12.2%
Annelida	Tubicidae	11.2%
Annelida	<i>Sphaerosyllis californiensis</i>	9.3%
Nematoda	Nematoda unidentified	9.3%
Arthropoda	<i>Corophium heteroceratum</i>	7.4%
Annelida	<i>Cirriformia spirabanchia</i>	4.3%
Annelida	<i>Eudorella pacifica</i>	3.7%
Annelida	<i>Mediomastus</i> spp.	3.4%
Annelida	<i>Dorvillea rudolphi</i>	3.3%

Epifaunal invertebrates in the vicinity of the Potrero Power Plant were sampled by crab trap and otter trawl in 1989 and 1990. The most abundant species collected in the crab traps were rock crabs (*Cancer antennarius*, *Cancer productus*, and *Cancer gracilis*) (SECAL 2000a, AFC Appendix G page 55). The most abundant invertebrate species collected in otter trawls were bay shrimp (*Crangon nigromaculata* and *Crangon* spp.). There is a live bait fishery for bay shrimp in San Francisco Bay (Chambers Group 1994). Key fishing locations include South Bay, northwestern San Pablo Bay and Carquinez Strait.

In January 2001, Tenera started conducting monthly trawl surveys to update information on marine resources in the vicinity of the Potrero PP. Results of the surveys from January, February and March 2001 have been submitted (MIRANT2001BioSamp3, page 4-10). Epifaunal invertebrates collected by trawls in the vicinity of Potrero PP included many shrimp (primarily *Crangon nigricauda* and *Heptacarpus stimpsoni*), a few rock crabs (*Cancer antennarius*, *Cancer productus*, and *Cancer gracilis*) and substantial numbers of Dungeness crab (*Cancer magister*), a species of commercial importance (MIRANT2001BioSamp3, page 4-10). Dungeness crab ranged in size of carapace width from 37 to 160 mm. At that size they are ready to recruit into the fishery (B. Ota personal communication 2001). Most of the Dungeness crabs collected were in the 63 mm to 105 mm size range.

Otter trawls to collect demersal (bottom dwelling) fishes in the vicinity of Potrero PP were conducted in January, February and March of 2001. Speckled sandabs (*Citharichthys stigmaeus*), which comprised 52 percent of the total number of fishes caught, were the most abundant species (MIRANT2001BioSamp3, page 4-10). The only other species caught in substantial numbers were English sole (*Parophrys vetulis*) (23 percent of the total), bay goby (*Lepidogobius lepidus*) (18.3 percent of

the total), and shiner surfperch (*Cymatogaster aggregata*) (2.8 percent). Twenty-three other species of fish were caught in low numbers. No other fish species accounted for more than 0.5 percent of the total otter trawl catch.

Midwater trawls were conducted near the Potrero PP in January and February of 2001 to sample water column fishes. Very few fish were caught. The January catch consisted of 3 longfin smelt (*Spirinchus thaleichthys*), and one individual each of topsmelt (*Atherinops affinis*), threadfin shad (*Dorosoma petense*), and northern anchovy (*Engraulis mordax*) (MIRANT2001BioSamp3, page 4-6). In February a single northern anchovy was collected. The three most abundant water column species collected near the Potrero PP by gill net in 1989 and 1990 were northern anchovy, Pacific herring (*Clupea harengus*), and white croaker (*Genyonemus lineatus*) (SECAL 2000a, AFC Appendix G page 52).

Larval fishes and megalopal crabs in the vicinity of the Potrero PP were collected in January and February 2001. Pacific herring were the most abundant larval fish species (51 percent), followed by bay gobies (9 percent), unidentified gobies (12 percent) and yellowfin gobies (*Acanthogobius flavimanus*) (12 percent) (MIRANT2001BioSamp3, page 2). Larval crab species collected included yellow rock crab (*Cancer anthonyi*) and hairy rock crab (*C. jordanii*).

Pacific herring spawn in the vicinity of the Potrero PP. They lay their eggs in shallow water on hard substrate or on marine vegetation. Pacific herring support an important commercial fishery in San Francisco Bay. The focus of the herring fishery is the roe, which is exported to Japan. About 90 percent of the herring landed in California ports are caught in San Francisco Bay. Herring fishing activity occurs during spawning, generally December through March (Chambers Group 1994). There is also recreational fishing for Pacific herring in San Francisco Bay. A survey of herring eggs near the Potrero PP in 1990 estimated that 21,660,000,000 eggs were deposited near the power plant site following a January 3 through 6, 1990, spawning event (SECAL 2000a, AFC page 61). The total egg deposition near the plant represented less than 1.5 percent of the total number of eggs estimated by the California Department of Fish and Game to have been deposited throughout San Francisco Bay during that spawning event. In 2001, all of the herring spawning occurred north of Potrero in Richardson Bay (B. Ota personal communication, 2001).

The protected waters of San Francisco Bay provide important habitat for resident and migratory water birds. The avifauna of open water in the vicinity of Potrero PP includes loons and grebes, pelicans and cormorants, gulls and terns, and a variety of waterfowl including ducks and scoters. Scaup and scoters, which are winter migrants, account for approximately 90 percent or more of the waterfowl in the open water of Central Bay (Chambers Group 1994).

Western gulls (*Larus occidentalis*) breed along the shore in the vicinity of the project site including a small colony at Potrero Point (Carter et al 1992). Other seabird breeding colonies near Potrero include pelagic cormorants (*Phalacrocorax pelagicus*) and Brandt's cormorants (*P. pencillatus*) on Yerba Buena Island, a large double-crested cormorant (*P. auritus*) colony on the Bay Bridge, and California least

tern (*Sterna antillarum browni*) and Caspian tern (*S. caspia*) colonies across the bay at Alameda Naval Air Station.

During their March 10, 2000, reconnaissance survey, the applicant's biologists observed western gulls flying over the open water in the vicinity of the Potrero Power Plant (SECAL 2000b, AFC Supplement pages 8.2-4-8.2-5). North of the site they saw Brandt's cormorants, American coots (*Fulica americana*), western grebes (*Aechmophorus occidentalis*) and surf scoters (*Melanitta perspicillata*) swimming in the open water and Canada geese (*Branta canadensis*) on the piers. Waterbirds observed in the vicinity of Islais Creek, south of the Potrero PP, included least sandpipers (*Calidris minutilla*), western sandpipers (*C. mauri*), and spotted sandpipers (*Actitis macularia*) on the mudflats and ring-necked ducks (*Aythya collaris*), lesser scaups (*A. affinis*), western grebes, eared grebes (*Podiceps nigricollis*), and common golden eye (*Bucephala clangula*) swimming in the creek. Lesser scaups and ruddy ducks (*Oxyura jamaicensis*) were observed in open water adjacent to Islais Creek.

Common marine mammal species in San Francisco Bay include harbor seals (*Phoca vitulina*) and California sea lions (*Zalophus californianus*). Harbor seals use San Francisco Bay for foraging, resting, and breeding. Large numbers of harbor seals haul out at Yerba Buena Island in Central Bay, where up to 213 seals have been counted on land (Green et al 1999). A harbor seal was observed near the Potrero site during the March, 2000 reconnaissance survey (SECAL 2000b, AFC Supplement page 8.2-5).

California sea lions have become a conspicuous part of the San Francisco Bay marine mammal fauna within the last 15 years. This species has a large and growing population breeding in the summer on island rookeries in southern California (Bonnell and Dailey 1993). A portion of this breeding population, mostly adult and sub-adult males, migrates northward in the fall. Relatively small numbers establish themselves in the San Francisco Bay Area (less than 2,000 animals) (Chambers Group 1994).

The harbor porpoise (*Phocoena phocoena*) was once a common species in San Francisco Bay and apparently still uses these waters, but sightings in recent years are relatively rare (Szczepaniak and Webber 1985). Gray whales (*Eschrichtius robustus*) and humpback whales (*Megaptera novaeangliae*) may occasionally wander into San Francisco Bay, but do not typically occur there.

SENSITIVE SPECIES

Table 2 lists sensitive aquatic species of San Francisco Bay.

**Aquatic Biological Resources Table 2: Sensitive Aquatic Species
Potentially Occurring in the Project Vicinity**

<u>Scientific Name</u>	<u>Common Name</u>	<u>Status*</u>
OSTEICHTHYES	BONY FISHES	
<i>Acpenser medirostris</i>	Green sturgeon	FSC, SSC
<i>Hypomesus transpacificus</i>	Delta smelt	FT, ST
<i>Spirinichus thaleichthys</i>	Longfin smelt	FSC, SSC
<i>Oncorhynchus tshawytscha</i>	Chinook salmon	
	Winter run	FE, SE
	Spring run	FT, ST
	Central Valley fall/late fall run	FC, SSC
<i>Oncorhynchus mykiss</i>	Steelhead	
	Central California Coast Evolutionarily Significant Unit (ESU)	FT
	Central Valley ESU	FT
<i>Eucyclogobius newberryi</i>	Tidewater goby	FPD, SSC
<i>Pogonichthys macrolepidotus</i>	Sacramento splittail	FT, SSC
AVES	BIRDS	
<i>Gavis immer</i>	Common loon	SSC
<i>Pelecanus occidentalis californicus</i>	California brown pelican	FE, SE
<i>Phalacrocorax auritus</i>	Double-crested cormorant	SSC
<i>Branta canadensis leucoparcia</i>	Aleutian Canada goose	FPD
<i>Bucephalia islandica</i>	Barrow's goldeneye	SSC
<i>Charadrius alexandrinus nivosa</i>	Western snowy plover	FT, SSC
<i>Numenius americanus</i>	Long-billed curlew	SSC
<i>Larus californicus</i>	California gull	SSC
<i>Sterna elegans</i>	Elegant tern	FSC, SSC
<i>Sterna antillarum browni</i>	California least tern	FE, SE
MAMMALIA	MAMMALS	
<i>Megaptera novaeangliae</i>	Humpback whale	FE

* **Status Legend:** **FE** = Federal Endangered, **FT** = Federal Threatened, **SE** = State Endangered, **ST** = State threatened, **FC** = Federal Candidate, **FPD** = Federal Proposed Delisted, **FSC** = Federal Species of Concern, and **SSC** = State Species of Concern

Sensitive fish species that may occur in the vicinity of the Potrero PP intake and discharge structures include green sturgeon (*Acpenser medirostris*), longfin smelt (*Spirinichus thaleichthys*), Chinook salmon (*Oncorhynchus tshawaytscha*) and steelhead (*Oncorhynchus mykiss*).

The San Francisco Bay estuary supports the southernmost reproducing population of green sturgeon, a Federal Species of Concern and California Species of Special Concern (Moyle and Yoshiyama 1992). Green sturgeon spawn in the Sacramento River and spend most of their lives in the ocean. Within San Francisco Bay they generally would be expected to occur in the northern portion between the Golden Gate and the Sacramento-San Joaquin River Delta. No green sturgeon have been collected in any surveys near the Potrero PP (SECAL 2000b, AFC Supplement p. 8.2-13). However, individual green sturgeon may on rare occasions swim into the area.

Longfin smelt are a Federal Species of Concern and California Species of Special Concern. Adult longfin smelt are broadly distributed throughout San Francisco Bay, but use the river channels of the Delta for spawning. They were collected in recent midwater trawls in the vicinity of Potrero PP (MIRANT2001BioSamp3, page 4-6), and presumably occur regularly in the project area.

Chinook salmon move from the Pacific Ocean through San Francisco Bay to the tributaries and upper reaches of the Sacramento River and, to a lesser extent, to the San Joaquin River where they spawn and die. When they are about 1 year old, the smolts move downstream through the estuary to the ocean. San Francisco Estuary supports four genetically distinct runs designated by the season in which they enter fresh water to spawn. The winter run is both Federal and State Endangered. The spring run is Federal and State Threatened. The Central Valley fall and late fall runs are Federal Candidates for listing and California Species of Special Concern. Although within San Francisco Bay Chinook salmon would be expected to occur most frequently in the waters between the Golden Gate and the Delta, they are sometimes found in the vicinity of Potrero PP. Chinook salmon are collected by midwater trawl at CDFG Station 109 near Potrero PP. Chinook salmon have also been impinged on the intake of the nearby Hunters Point Power Plant (SECAL 2000a, AFC Appendix G Page 139).

Steelhead are anadromous rainbow trout that hatch in freshwater, swim downstream to spend their adult lives in the ocean and return to freshwater to spawn. Two genetically distinct populations of steelhead occur in San Francisco Bay. Both populations are listed as Threatened by the federal government. The Central Valley Evolutionarily Significant Unit (ESU) includes steelhead that spawn in the Sacramento and San Joaquin Rivers and their tributaries. The California Coast ESU includes steelhead that run in coastal basins from the Russian River, south to Soquel Creek and in streams of the San Francisco and San Pablo Basins. Currently small steelhead runs exist in the South Bay in San Francisco Creek, the Guadalupe River, Coyote Creek and Permanente Creek as well as in several streams in Central Bay and San Pablo Bay. The project area is within Designated Critical Habitat for the Central Valley ESU. Steelhead spawning in South Bay streams might pass through the project area on their way to their spawning streams, and juveniles may also pass through the area on their migration out to the ocean. Steelhead have not been collected in any of the fish surveys at Potrero PP, but they have been impinged at the intake of the nearby Hunters Point Power Plant (SECAL 2000a, AFC Appendix G Page 139).

Three other sensitive San Francisco Bay fish species, Delta smelt (*Hypomesus transpacificus*), tidewater goby (*Eucyclobobius newberryi*), and Sacramento splittail (*Pogonichthys macrolepidotus*) would not be expected near Potrero PP. The range of the Delta smelt is from the Sacramento and San Joaquin Rivers downstream to Suisun Bay (Monroe and Kelly 1992). During periods of high river flow, some individuals are washed into San Pablo Bay. Delta smelt would not be expected as far west as Central Bay. Tidewater gobies live in brackish water in shallow lagoons and lower stream reaches. They have not been found in recent surveys of San Francisco Bay streams and may be extinct in the Bay and its drainages (San

Francisco Estuary Project 1997). Sacramento splittail are a primarily freshwater fish that are largely confined to brackish and freshwater habitats of the Delta, Suisun Bay, and Suisun Marsh (Moyle et al 1989).

Sensitive seabird species likely to occur in the vicinity of Potrero PP include double-crested cormorant, California least tern, common loon (*Gavis immer*), California brown pelican (*Pelecanus occidentalis californicus*), California gull (*Larus californicus*), Barrows goldeneye (*Bucephalia islandica*), and elegant tern (*Sterna elegans*).

Double-crested cormorants are a California Species of Special Concern. A large colony breeds on the Bay Bridge, approximately 2 miles north of Potrero PP. They would be expected to forage frequently within the project area.

The Federal and State Endangered California least tern breeds across the Bay from Potrero PP at the former Alameda Naval Air Station. California least terns winter in Central and South America and are present at their California breeding colonies between April and August. They forage in the waters near their breeding colony. Terns from the Alameda colony might forage occasionally in the vicinity of Potrero PP.

The Federal and State Endangered California brown pelican breeds in the spring on islands in southern California and Mexico and migrates north after the breeding season. They are common in San Francisco Bay where they forage over open water and roost on many breakwaters and piers. They would be expected in the vicinity of Potrero PP.

A number of bird species of special concern visit San Francisco Bay during the non-breeding season and would be expected near Potrero PP. These include common loon, California gull, elegant tern, and Barrow's goldeneye. Other sensitive bird species including the Federal Threatened Aleutian Canada goose (*Branta canadensis*) (proposed for delisting), the Federal Threatened western snowy plover (*Charadrius alexandrinus nivosus*), and the long-billed curlew (*Numenius americanus*), a California species of Special Concern, would be unlikely to occur in the immediate vicinity of Potrero PP because of a lack of appropriate habitat. Long-billed curlews may forage in mudflats at Islais Creek south of the power plant. Canada geese have been observed near Potrero PP, however the Aleutian subspecies that occur seasonally in the San Francisco Bay area are generally birds that winter in the Sacramento and San Joaquin Valleys (Small 1994).

IMPACTS

DIRECT AND INDIRECT IMPACTS

The California Environmental Quality Act Guidelines define direct impacts as those impacts that result from the project and occur at the same time and place. Indirect impacts are caused by the project, but can occur later in time or farther removed in distance, but are still reasonably foreseeable and related to the project. The

potential impacts discussed below are those most likely to be associated with construction and operation of the project.

CONSTRUCTION

COOLING WATER INTAKE SYSTEM

A new intake structure with sufficient capacity for withdrawal of Bay water for cooling of both Units 3 and 7 will be constructed to replace the existing Unit 3 intake. The existing Unit 3 outfall will be replaced with a new offshore diffuser and a second offshore diffuser will be constructed for the Unit 7 discharge.

The existing Unit 3 cooling water intake structure will be abandoned in place. The new combined Unit 3 and Unit 7 intake structure will be constructed south of the current Unit 3 cooling water discharge location. The intake structure will consist of an intake chamber approximately 200 feet long opening into a series of traveling screens and four, 50 percent flow circulating water pumps. The screen mesh will be approximately 5/32 inch. The water flow approach to the screens will be about 0.4 foot per second.

Construction of the cooling water intake structure for the Unit 7 project will occur inside a cofferdam that will be enclosed in a silt curtain. The area enclosed by the cofferdam will be de-watered. The area inside the perimeter of the cofferdam will be excavated and a concrete base slab will be constructed. The intake structure will be constructed inside the cofferdam. The concrete for the perimeter walls of the structure will be placed directly against the inner wall of sheet piling of the cofferdam. Once the structure is complete, the outer wall of sheet pile and the sheet piling above the intake screens on the inner wall will be removed. Approximately 4,050 cubic yards of material in the area in front of the intake structure will be dredged to depths agreed upon with the U.S. Army Corps of Engineers/Dredged Material Management Office (DMMO) in conjunction with the dredging permit process. A silt screen will be placed around all dredging operations to contain re-suspended sediment. Dredged sediment determined to be suitable for aquatic disposal will be discharged at locations in San Francisco Bay approved by the U.S. Army Corps of Engineers/DMMO in compliance with permit requirements. Dredged material determined to be unsuitable for ocean disposal will be placed at an approved upland disposal location.

Intertidal organisms that live in the concrete rubble where the new intake will be constructed will be destroyed by de-watering, the placement of the cofferdam, and construction of the intake structures. Sessile organisms within this approximately 0.15-acre area (linear distance about 200 feet) include barnacles, rock jingles, rockweed and various species of red and green algae. Mobile organisms such as shore crabs may be able to escape.

The concrete rubble grades into soft bottom habitat in the shallow subtidal. Approximately 0.1 acres of soft bottom habitat will be permanently lost by construction of the intake structure. Soft bottom organisms will also be destroyed within the approximately 0.4-acre area that will be dredged in front of the intake

structure. Grab samples taken in soft bottom habitat in the vicinity of the area that will be disturbed by intake construction were dominated by nematode worms, oligochaete worms, and the polychaete worm *Exogone lourei*. After the completion of construction, the area within the dredge footprint would be re-colonized by benthic organisms. The benthic community within the dredged area would be expected to be similar to that before dredging. Oligochaetes and nematodes are opportunistic organisms that rapidly colonize disturbed area. Some of the less opportunistic species may take longer to re-colonize. Field studies of dredged areas have shown that recovery of benthic communities occurs within 2 weeks to 3 years after dredging stops (McCauley, Parr, and Hancock 1977; Oliver et al 1977; Rosenberg 1977).

Most mobile organisms would be able to escape the dredge. There is some potential that small crabs, including Dungeness crabs, may become entrained by the dredge. Observations of dredging operations have not indicated that the dredge entrains large numbers of crabs. The impact of dredging on Dungeness crab would probably be limited to a few individuals and would be expected to be insignificant.

Separate cooling water discharges will be constructed for Unit 3 and Unit 7. The discharge for Unit 3 will replace the current shoreline outfall structure. Each discharge will consist of a pair of 54-inch diameter pipes laid on the bottom of the Bay and extending off shore approximately 900 feet to a depth of between 20 and 28 feet Mean Lower Low Water (MLLW). The last 200 feet of the pipe will be equipped with multiple diffuser ports. The 30 feet length of pipe closest to the shoreline will be covered with rip rap. The more offshore portions of the pipes will be covered with a gravel mattress.

The outlet structures for the cooling water discharge will be placed on land. The transition from the onshore conduits to the offshore discharge pipes will be constructed using a cofferdam similar to that used to construct the intake structure. The discharge pipes will be placed directly on the Bay bottom and held in place with either the rip rap or the marine mattress. No dredging will be required for the Unit 7 discharge. Approximately 190 cubic yards will be dredged to lay the pipelines for the Unit 3 discharge.

Most of the soft bottom benthic organisms within the approximately 3.5-acre footprint of the discharge pipes will be lost by construction of the outfall. Soft bottom habitat within the outfall footprint will be permanently converted to hard bottom substrate.

In addition to the direct effects of construction on organisms within the intake and outfall construction and dredging footprints, dredging and in-water construction activities will disturb aquatic organisms in the vicinity of the construction. Marine construction work is expected to occur over a period of between 18 and 24 months.

Turbidity created by the re-suspension of sediments during dredging and in-water construction can bury sessile organisms, reduce the light levels available for photosynthesis of algae, clog the gills and feeding structures of aquatic animals, and interfere with the foraging activities of piscivorous (fish eating) seabirds and

marine mammals. Contaminants in re-suspended sediments also may be released into the water column and become bioavailable. Because dredging and construction will be done within a silt curtain, most of the re-suspended sediments will be contained within the immediate construction area. Therefore, the impacts of turbidity will be limited to the area disturbed directly by construction, and would be insignificant.

The noise and activity of construction may alter the behavior of fishes or cause them to avoid the construction area temporarily. Ford and Platter Rieger (1986) studied the reaction of schooling fishes to pile driving. Pile driving had no apparent effect on the behavior of topsmelt (*Atherinops affinis*). However, northern anchovy exposed to pile driving sounds at close range altered their behavior and seemed agitated. There was a consistent tendency for anchovy to move away from the main pile driving sound source. Fish surveys were done immediately following a dredging program in Marina del Rey Harbor in Los Angeles County (Soule et al. 1993). An unusually low number of fish species was collected, and the investigators concluded that the dredging had disturbed the fishes. When fishes in the area were sampled again a few months later, the number of fish species collected had returned to normal. Therefore, the disturbance to fishes from dredging and in-water construction would be expected to be short term.

The temporary impacts of construction on most fish and aquatic invertebrate species are expected to be insignificant because of the limited area that would be affected (approximately 5 acres). However, there is a potential that construction could interfere with herring spawning or salmonid migration. Interference with either of these activities could be a potentially significant impact.

Seabirds and marine mammals may avoid the construction area during the 18 to 24 months of in-water construction although birds and marine mammals in San Francisco Bay are accustomed to a high level of activity. The area that will be disturbed by construction is small and it is not known to be an important foraging area for any bird or mammal species. Therefore, the impacts of construction on seabirds and marine mammals are expected to be insignificant.

In addition to turbidity and disturbance, there is a concern that dredging may result in the exposure or spread of contaminants that may be present in the dredged sediments. High concentrations of polyaromatic hydrocarbons (PAH) have been found in sediments offshore Potrero PP (SECAL 2000, Seds 1, page 11). Other contaminants were at or near background levels. PAH concentrations generally increased with depth.

PAH compounds are carcinogenic and mutagenic and may bioaccumulate (Monroe and Kelly 1992). Acute toxicity to saltwater aquatic life occurs at concentrations as low as 300 micrograms per liter in the water (Environmental Protection Agency 1986). Sublethal effects on aquatic organisms at lower concentrations are likely but have not been well defined.

The high level of PAHs in the project area is an existing condition. Construction of the intake structure and removal of sediments behind the cofferdam may decrease

the exposure of aquatic organisms to PAHs within the footprint of the intake structure. The spread of contaminated sediments during dredging is unlikely because of the use of a silt curtain to contain the dredged sediments. However, because PAH concentrations increase with depth, dredging may expose contaminated sediments that presently are buried. The applicant has stated in response to staff's data request that contaminated sediments will be avoided to the extent possible (SECAL 2001, Data Request Set 3, Data Response No.165). The applicant has conducted additional sediment sampling to further delineate the horizontal and vertical extent of PAH concentrations in nearshore coastal sediments. Until the results of the second survey are available, the potential impacts of contaminated sediments on aquatic organisms cannot be evaluated.

CABLE CONSTRUCTION UNDER ISLAIS CREEK

Cables will be installed by boring under Islais Creek. Islais Creek sediments are highly contaminated with hydrocarbons (San Francisco Estuary Project 1991). If the bore is near the surface, a structural failure, called a "frac-out", can occur. The California Department of Fish and Game (CDFG) has expressed concern that construction near Islais Creek may have the potential to suspend contaminants present in creek sediments (B. Ota personal communication 2000). Staff submitted a data request asking the applicant to describe the procedures that would be used to avoid contamination of Bay waters in the event of a "frac-out" when boring under Islais Creek (CEC 2000 Data Request Set 3, Data Request No.167). The applicant responded that the potential for "frac-out" is low when boring in soft sediments such as the bay muds found under Islais Creek (SEP 2001 Data Response Set 3, Data Response No.167). The data response also addressed the cleanup of the drilling fluids if a frac-out occurs. However, the data response did not address the containment of contaminated creek sediments if a frac-out occurs and cleanup is needed.

PERMANENT CHANGES TO BAY HABITAT

As described above under construction impacts, the construction of the new intake and discharge structures will result in some permanent changes in Bay habitat. The construction of the intake structure will result in the permanent loss of approximately 0.25 acres of Bay habitat. About 0.15 acres of the habitat (covering a linear distance of about 200 feet of shoreline) that would be permanently lost is concrete rubble that supports a relatively depauperate rocky intertidal community of barnacles, mussels, rock jingles, shore crabs and algae. Some hard bottom organisms such as barnacles, mussels and some species of algae would be expected to colonize the intertidal and subtidal portions of the new intake structure. However, because of the lack of relief, the intertidal community on the intake structure would be expected to be even less diverse than the one on the concrete rubble.

About 0.1 acres of low intertidal/shallow subtidal habitat will also be filled by construction of the new intake structure. The soft bottom habitat supports a relatively diverse assemblage dominated by nematode, oligochaete and polychaete worms (MIRANT2001 BioSamp3, page 2-7).

Because San Francisco Bay is a unique estuarine ecosystem that supports many sensitive species, permanent loss of Bay habitat is considered a significant impact. For the fill of Bay habitat, the applicant will be required to obtain a permit from the U. S. Army Corps of Engineers. The Corps, and the resource agencies with which it consults, most likely will require compensatory mitigation for the loss of Bay habitat.

Construction of the discharge will replace approximately 3.5 acres of soft bottom habitat with hard bottom habitat. Generally, hard bottom habitat is considered more valuable than soft bottom because it is much more limited in distribution. In the approximately 0.12 acres closest to shore, the pipes will be covered with rip rap. This rip rap will provide relatively high quality hard bottom habitat. Encrusting invertebrates and algae will colonize the rocks. The crevices between the rocks will provide shelter for demersal fishes and mobile invertebrates such as crabs. Fishes associated with hard bottom will be attracted to the rip rap. The remaining approximately 3.38 acres of pipeline that will be covered by a gravel mat will also provide hard bottom habitat but of lower quality than the rip rap. Algae and sessile invertebrates will grow on the mat and fishes will be attracted to the structure of the pipe. However, the mat will not have crevices to shelter crabs and fishes. The lower relief and smoother surface of the mattress will be less attractive to fishes than the rip rap.

Communities for a Better Environment (CBE) submitted a data request asking how attraction to the outfall might affect what anglers might catch (CBE2001DReqCEC1, Data Request No. 72). The applicant responded that few anglers fish in the immediate vicinity of Potrero PP and that little change in fish distribution relative to the new outfall would be expected (Mirant 2001DRespCBE, Data Response No. 72). Staff concurs with the applicant's response. The amount of hard bottom habitat created by construction of the outfall is only 3.5 acres, of which only the 0.12 acres of rip rap will be highly attractive to hard bottom fishes. The number of fishes attracted away from shoreline rip rap, piers, and other areas where anglers might fish would be limited to a few individuals. No perceptible impact on fishing success would be expected.

COOLING WATER DISCHARGE

Impacts of the thermal effluent on biological resources may include changes in the abundance and distribution of sessile invertebrates and algae to favor species with a tolerance or preference for higher temperatures, avoidance of areas with elevated temperature by mobile species sensitive to elevated temperatures, and effects on the development of herring eggs attached to structures within the thermal plume.

Elevated temperatures of the plant's existing shoreline discharge have been observed to be associated with noticeable changes in the species composition and abundance of intertidal and subtidal algae in the immediate vicinity of the discharge but have been observed to have little effect on invertebrates (SECAL 2000a, AFC page 8.2-16). Studies of fishes in the vicinity of Potrero PP did not indicate that fishes avoided areas of elevated temperature (SECAL 2000a, AFC Appendix G pages 25 and 53).

Data from Pacific herring surveys showed that spawning occurred in the immediate area of the discharge (SECAL 2000b, AFC Supplement page 8.2-10). Herring eggs exposed to the warm plume water had shorter incubation periods and the length at hatching was smaller than those eggs and larvae collected from areas not contacted by the plume. It is possible that these smaller larvae may have a decreased chance of survival compared to the larger larvae that hatched in areas unaffected by the discharge.

The Unit 7 project will replace the existing Unit 3 shoreline discharge with offshore discharges through diffusers for both Unit 3 and Unit 7. The present Unit 3 discharge raises ambient water temperatures by 2 degrees Fahrenheit (F) or more over an area that ranges from 10 to 150 acres and averages 55 acres (SECAL 2000a, AFC page 8.14-10). The existing discharge sometimes results in a temperature elevation at the shoreline that is 10 degrees F above ambient (SECAL 2000b, AFC Supplement Figures 8.2-4 through 8.2-6).

The relocation of the thermal discharge from Unit 3 to several hundred feet offshore as well as the use of a diffuser section should result in a greater dilution of the heated wastewater as well as a reduced chance of elevated temperatures at the shoreline. However, the Unit 7 discharge will be added to the Unit 3 discharge resulting in a total daily discharge of thermal effluent that may be double that of the existing Unit 3 discharge. The applicant has not provided information on the thermal plume from the most recent design of the outfalls. Until that information is provided the effect of the cooling water discharge on aquatic biological resources cannot be analyzed.

In addition, to the potential thermal impacts of heated wastewater, the cooling water discharge has the potential to impact aquatic organisms by discharging contaminants to the Bay. Sodium hypochlorite and sodium bisulfate are used to clean the intake and discharge structures (SEP 2001 Data Response Set 3, Data Response No. 166). In accordance with the National Pollution Discharge Elimination System (NPDES) permit, no chlorine is discharged into the Bay. A June 2000 analysis of metals concentrations at the intake and the discharge showed that nickel and copper were elevated slightly at the discharge compared to the intake (SECAL 2000b, AFC Supplement Appendix O4). Therefore the discharge may be contributing minor amounts of these metals to the Bay environment. However, the discharge concentrations of these metals were substantially lower than the limiting concentrations specified in the NPDES permit (SECAL 2000a, AFC Appendix O1) and would not be expected to be harmful to aquatic organisms.

IMPINGEMENT AND ENTRAINMENT BY THE COOLING WATER INTAKE

Aquatic animals in the vicinity of the Potrero PP may be impinged on the intake screens or entrained in the cooling water that is drawn into the cooling water system. A 1978-1979 study of fishes and macroinvertebrates impinged at the Unit 3 intake showed that during the year sampled in the study, 55,611 fish with a total weight of 642.8 kilograms and 262,867 invertebrates were impinged (SECAL 2000a, AFC Appendix G page 78). The fish species impinged in the greatest numbers was northern anchovy. No state or federally listed fish species were

impinged. The invertebrates impinged in the greatest number were rock crab (*Cancer antennarius*), blacktail shrimp (*Crangon nigricauda*), and red rock crab (*Cancer productus*).

Impingement of Chinook salmon and steelhead would be considered a significant impact because these species are listed or, in the case of the fall and late fall runs of Chinook salmon, candidates for listing. Staff submitted a data request asking the applicant to explain why Chinook salmon are impinged at the nearby Hunters Point intake but not at Potrero (CEC 2000 Data Request Set 4, Data Request No. 170). The applicant responded that the long pre-intake conduits of the Hunters Point intake make the probability of impinging salmon and steelhead at Hunters Point significantly greater than at the Potrero PP (SEP 2001 Data Response Set 4, Data Response No. 170).

During the 1978-79 study of impingement at the Unit 3 intake, a total of 10,646 rock crabs (*Cancer antennarius* and *C. productus*) were impinged. Recent trawl surveys have collected large numbers of Dungeness crab in the vicinity of Potrero PP. Impingement of significant numbers of Dungeness crab at the combined Unit 3 and Unit 7 intake may have an adverse impact on populations of this species within the Bay and ultimately on the crab fishery. In addition, 5,129 bay shrimp (*Crangon* spp.) were impinged at the Unit 3 intake between 1978 and 1979. There may be a potential that the intake could impact the South Bay shrimp fishery.

The new combined Unit 3 and Unit 7 intake will include features designed to reduce impingement. The approach velocity will not exceed 0.4 feet per second. This velocity is below the velocity requirement of 0.5 feet per second proposed by the Environmental Protection Agency in its Proposed Rules for Cooling Water Intake Structures for New Facilities (Environmental Protection Agency 2000). Many adult fishes can escape impingement at intake velocities below 0.5 feet per second.

The new Unit 3 and Unit 7 intake also will have a continuously rotating inclined screen design. These screens are expected to reduce the amount of debris buildup in front of the intake, which will reduce the number of organisms trapped in debris and allow more juvenile and adult organisms to avoid impingement (SECAL 2000a, AFC page 8.2-13). The applicant also proposes to reduce impingement losses by implementing a fish return system equipped with a low-pressure spray wash.

However, the total cooling water flow of the new intake unit will exceed that of the existing Unit 3 intake. The greater flow may increase the potential for organisms to become impinged. In addition, a smaller screen mesh will be used for the new intake. The smaller mesh will reduce the size of organisms entrained but may increase impingement. The actual impacts of impingement at the new intake cannot be determined until the new intake is constructed and impingement of aquatic organisms documented.

A 1978-1979 study of entrainment at the Potrero PP intakes found that Pacific herring and gobies were the species entrained in the greatest numbers (SECAL 2000a, AFC Appendix G page 70). Staff believes that current data on the distribution and abundance of fish and crab larvae near the intake and in the source

water are necessary to determine the impacts of the new intake on aquatic resources.

Staff is concerned that the impacts of the intake on aquatic resources cannot be determined from studies done many years ago. Because the information on aquatic resources in the AFC was based on studies done more than 10 years ago, staff submitted a data request that the information be updated with new studies (CEC2000 Data Request Set 1, Data Request No. 16). An agreement was drafted between the applicant and staff stating that the applicant would collect three month's of fish and plankton data in the vicinity of Potrero PP to determine whether data collected in the earlier surveys were still valid (CEC/SEP 2000 MOU 1).

In January of 2001, Mirant initiated trawl surveys to identify fish and macroinvertebrates that may be subjected to impingement and a 316(b) Resource Assessment study to predict the impacts of entrainment. Based on the results reported in the applicant's progress reports (MIRANT 2001 Bio Sampling 3), staff determined that changes have occurred in the biota since the earlier studies, and that biological surveys should continue (CEC 2001 Biology Memo). Staff requested that the applicant continue trawl surveys until the preparation of the Final Staff Assessment (FSA). After certification, the actual impingement impacts shall be determined by a documentation of all species impinged at the new intake.

Staff suggests that 316(b) ichthyoplankton studies be continued for a full year. When a full year of surveys have been completed to document seasonal variability in ichthyoplankton populations, an updated analysis will be performed to determine the impacts of the new cooling water intake.

CUMULATIVE IMPACTS

Section 15130 of the CEQA Guidelines requires a discussion of cumulative environmental impacts when they are determined to be potentially significant. Cumulative impacts are defined as those impacts that are created because of the combination of the project evaluated in conjunction with other projects causing similar impacts. The CEQA Guidelines require that the discussion reflect the severity of the impacts and the likelihood of their occurrence, but need not provide as much detail as the discussion of the impacts attributable to the proposed project alone.

The CEQA Guidelines also mandate two different ways in which cumulative impacts are to be evaluated. One of these mandated approaches is to summarize growth projections in an adopted General Plan or in a prior certified environmental document. The second method involves compilation of a list of past, present, and probable future projects producing related or cumulative impacts. The second method has been utilized for the purposes of this Preliminary Staff Assessment.

The Unit 7 project will result in the permanent loss of approximately 0.25 acres of Bay habitat. The loss of Bay habitat will contribute to significant cumulative loss of habitat in San Francisco Bay. About 40 percent of the original surface area of the Bay has been diked off or filled since 1850 (BCDC 1999). To offset this cumulative

loss of habitat both the Federal and State governments have adopted policies of no net loss of wetlands. To construct the new intake and outfall the applicant will be required to obtain a permit under Section 404 of the Clean Water Act. As a permit condition, compensatory mitigation in the form of habitat creation or restoration may be required to offset the loss of Bay habitat.

The Hunters Point Power Plant is located approximately 1.3 miles south of Potrero PP. Aquatic organisms in the vicinity of these power plants are vulnerable to impingement and entrainment from the intakes of both these facilities. The Hunters Point Power Plant may be shut down before the Unit 7 project becomes operational. If that occurs, there will no longer be a cumulative impact to aquatic resources from the intakes of two power plants in close proximity to each other. However, if Hunters Point continues to operate after the Unit 7 project comes on-line, there will be a cumulative impact on aquatic resources due to entrainment and impingement from the Hunters Point intake and the Potrero Units 3 and 7 intake. Staff submitted a data request asking the applicant to describe the cumulative impact of the intakes of both power plants on aquatic resources (CEC 2000 Data Request Set 3, Data Request No. 168). The applicant responded that because the 1971-1972 and 1989-1990 thermal effects studies were conducted while both plants were operating the results of those studies consider the impacts of both plants operating simultaneously (SEP 2001 Data Request Set 3, Data Response No. 168). Staff does not believe that this response or the previous studies adequately addressed the cumulative impacts of both intakes. Previous studies did not specifically analyze the impact of losses to both power plants on the populations of affected species. Furthermore, previous thermal effects studies were conducted over 10 years ago and need to be updated.

MITIGATION

APPLICANT'S PROPOSED MITIGATION MEASURES

The applicant proposed to use cofferdams and silt curtains designed to minimize the dredging impacts on surface water quality during dredging and in-water construction (SECAL 2000a, AFC page 8-14-22). The applicant also stated it would perform sediment testing and removal in accordance with Section 404 and Section 10 dredging permits (SECAL 2000a, AFC page 8.14-22).

The applicant stated it would participate with the Energy Commission and other responsible agencies to determine appropriate enhancement measures to offset cooling water intake structure and other water withdrawal effects on the populations of aquatic organisms that may be affected by the cooling water intake (SECAL 2000a, AFC page 8.2-19).

In response to a data request from the City and County of San Francisco (CCSF2000Dreq 1, Data Request No. 44), the applicant stated that if construction activities in the Bay occur within the herring spawning season of December through March, a qualified biologist would be retained (Mirant 2001, Dres CCSF, data Response No. 44). If the biologist determines that construction activities have the

potential to adversely affect spawning herring, the applicant stated adjustments to construction techniques would be implemented.

STAFF'S PROPOSED MITIGATION MEASURES

CONSTRUCTION

Staff concurs with the applicant's plan to use cofferdams and silt curtains to minimize the impact of dredging and in-water construction on water quality (See Aquatic Biological Resources Condition of Certification. **A-BIO-1**). Sediment testing and removal shall be performed in compliance with Section 10 and Section 404 permit requirements (See Aquatic Biological Resources Condition of Certification. **A-BIO-5**).

Staff also concurs with the applicant's proposal to hire a qualified biologist if in-water construction activities occur during the Pacific herring spawning season. The applicant and its biologist shall consult with CDFG regarding potential impacts to herring spawning. Any recommendations by CDFG to reduce or eliminate impacts to herring shall be implemented by the applicant. (For more information see Aquatic Biological Resources Conditions of Certification **A-BIO-2**, **A-BIO-3**, and **A-BIO-4**).

To avoid construction impacts on listed salmonids, staff contends the applicant should consult with the National Marine Fisheries Service (NMFS). Any measures including suspension of in-water construction during sensitive migration periods recommended by NMFS to avoid impacts to salmonids shall be implemented by the applicant (See Aquatic Biological Resources Condition of Certification **A-BIO-6**).

To avoid contamination of Bay waters from re-suspension of contaminated Islais Creek sediments during a frac-out, the applicant shall develop a plan to contain sediments within Islais Creek (See Aquatic Biological Resources Condition of Certification **A-BIO-7**).

PERMANENT CHANGES IN BAY HABITAT

To offset permanent loss of Bay habitat from construction of the intake structure, the applicant shall provide habitat compensation in the form of restoration or creation of Bay habitat as required under conditions set forth in the 404 permit issued by the Corps of Engineers for the intake structure (See Aquatic Biological Resources Condition of Certification **A-BIO-5**).

IMPINGEMENT AND ENTRAINMENT BY THE COOLING WATER INTAKE

Following construction, an updated analysis of the project-specific and cumulative impacts of the combined Unit 3 and Unit 7 cooling water intake needs to be completed. Staff recommends that the applicant complete a full year's study of ichthyoplankton and crab larvae at the cooling water intake and in source water and use these data to analyze the impacts of entrainment on fish and crab populations. Staff also recommends that the applicant monitor impingement at the new intake structure for the period of a year. The applicant shall use the data from these studies to determine the combined impact of impingement and entrainment at the

intake on aquatic resources of San Francisco Bay. Unless the Hunters Point Power Plant has been decommissioned by the time the Unit 7 project begins operations, the analysis shall specifically address the cumulative impact of impingement and entrainment at the Potrero PP and Hunters Point intakes. For more information, see Aquatic Biological Resources Conditions of Certification **A-BIO-9** and **A-BIO-10**.

If the monitoring program and updated analysis determines that the Potrero PP is having a significant adverse impact on any aquatic species, the applicant shall be required to mitigate for those impacts. A preliminary analysis of entrainment impacts is expected by the Final Staff Assessment. At that time a preliminary determination will be made as to whether mitigation for entrainment losses will be required. When a full year of ichthyoplankton and crab larvae surveys have been completed, a final analysis of entrainment impacts will be done.

Impingement impacts can not be fully determined until impingement at the new combined intake for Unit 3 and Unit 7 has been monitored for a year. After a year of impingement monitoring, the total impact of impingement and entrainment on aquatic resources will need to be assessed and final mitigation determined. Mitigation shall be in the form of a monetary contribution to an appropriate aquatic habitat restoration project(s) in San Francisco Bay. The final determination of monetary compensation will be determined in consultation with state, federal, and local agencies (See Aquatic Biological Resources Condition of Certification **A-BIO-11**).

COMPLIANCE WITH LAWS, ORDINANCES REGULATIONS AND STANDARDS

To comply with Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, Mirant must obtain a dredging permit from the Corps of Engineers/DMMO prior to dredging. Construction of the new intake and outfall would also require a Corps of Engineers Section 404 and Section 10 permit that must be obtained prior to construction. The Section 404 permit for the intake and outfall may fall under the conditions of Nationwide 7 for outfall structures.

Since a Federal permit will be issued for this project, to comply with the Magnuson-Stevens Fishery Management and Conservation Act, as Amended, the Corps of Engineers must consult the National Marine Fisheries Service (NMFS) regarding the potential effects of these actions on Essential Fish Habitat. The Corps of Engineers must also consult with NMFS to determine whether a formal consultation under Section 7 of the Endangered Species Act is required to address potential impacts on listed salmonids.

UNRESOLVED ISSUES

The following issues are currently unresolved:

- The potential impacts to aquatic resources of contaminants that may be exposed during dredging cannot be determined until the applicant provides the results of its second offshore sediment survey to determine the vertical and horizontal extent of contamination. This information will be provided by the applicant prior to the FSA along with the applicant's plan to avoid contamination during construction. Therefore, the FSA will provide an analysis of the potential impacts of contamination.
- The potential impacts to aquatic resources from exposure to contaminated creek sediments, and how they will be contained if there is a "frac-out" under Islais Creek during cable construction, needs to be better understood so staff can complete its analysis. It is expected that the applicant will provide this information prior to the FSA.
- The potential impacts to aquatic resources of the combined thermal plume from the new Unit 3 and Unit 7 outfall structures cannot be determined until the applicant provides the results of a model, accepted by staff, of the thermal plume from these discharges. It is expected that the extent of the thermal plume will be determined prior to the FSA, and that thermal plume impacts will be analyzed in the FSA.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff can not complete its analysis until the unresolved issues mentioned above are resolved. It is expected that additional information will be provided by Mirant prior to the FSA.

Staff has concluded that permanent loss of Bay habitat from construction of the cooling water intake, and impingement and entrainment from the intake of Bay water for the cooling water system may be significant at both the project-specific and cumulative levels. It is anticipated that with sufficient mitigation/compensation those impacts can be mitigated to a less than significant level.

RECOMMENDATIONS

Staff recommends that the following Conditions of Certification be adopted and implemented to ensure compliance with all applicable laws, ordinances, and regulations, to determine the significance of the potential impacts to aquatic resources from the cooling water intake, and to determine and implement any necessary mitigation for impacts that are found to be significant.

CONDITIONS OF CERTIFICATION

USE OF SILT CURTAIN AND COFFERDAM

A-BIO-1 The project owner shall perform all in-water construction and dredging within the confines of a cofferdam or silt curtain.

Verification: As part of the required monthly project compliance submittals, the project owner shall submit written records to the Compliance Project Manager (CPM) documenting the effective use of silt curtains and cofferdams. Should a situation occur in which failure of either of these devices resulted in significant release of dredged sediments to Bay waters, the project owner shall immediately notify the CPM.

DESIGNATED BIOLOGIST

A-BIO-2 If in-water construction or dredging occur during the Pacific herring spawning season of December through March, the project owner shall hire a Designated Biologist approved by the CPM to be onsite during construction and advise the project owner on how to minimize impacts to Pacific herring during project construction.

Protocol: The Designated Biologist must meet the following minimum qualifications:

- a. A Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field;
- b. At least three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or the Wildlife Society;
- c. At least one year of field experience with Pacific herring populations in San Francisco Bay; and
- d. An ability to demonstrate to the satisfaction of the CPM the appropriate education and experience for the biological resources tasks that must be addressed during in-water construction.

If the CPM determines the proposed Designated Biologist to be unacceptable, the project owner shall submit another individual's name and qualifications for consideration. If the approved Designated Biologist needs to be replaced, the project owner shall obtain approval of a new Designated Biologist by submitting to the CPM the name, qualifications, address, and telephone number of the proposed replacement. No in-water construction or dredging will be allowed during the herring spawning season until the CPM approves a new Designated Biologist and the new biologist is on site.

Verification: At least 90 days prior to the start of any in-water construction or dredging during the Pacific herring spawning season, the project owner shall submit to the CPM for approval, the name, qualifications, address and telephone number of

the individual selected by the project owner as the Designated Biologist. If a Designated Biologist is replaced, the information on the proposed replacement, as specified in the condition, must be submitted in writing at least ten working days prior to the termination or release of the preceding Designated Biologist.

A-BIO-3 The CPM-approved Designated Biologist shall perform the following during in-water construction and dredging during the herring spawning season:

- i) Observe the presence/absence, spawning and behavior of Pacific herring in the project area.
- ii) Contact CDFG if herring are observed and discuss herring activities.
- iii) Notify the project owner of any adjustments to construction activities recommended by CDFG as being necessary to protect herring.

Verification: During project construction, the Designated Biologist shall maintain written records of the tasks described above, and summaries of these records shall be submitted along with the monthly compliance reports to the CPM.

A-BIO-4 The project owner's Construction Manager shall act on the advice of the Designated Biologist to adjust construction activities to protect herring spawning.

Protocol: The project owner's Construction Manager shall adjust in-water construction activities, including halting dredging and in-water construction if necessary, to protect herring spawning.

The Designated Biologist shall:

- 1. Inform the project owner and the Construction Manager of measures necessary to protect herring, and
- 2. Advise the Energy Commission CPM if any corrective actions are needed or have been instituted.

Verification: Within two (2) working days of a Designated Biologist notification of non-compliance with a protective measure specified by CDFG, the project owner shall notify the CPM by telephone of the circumstances and actions being taken to resolve the problem. For any necessary corrective action taken by the project owner, a determination of success or failure will be made by the CPM with five (5) working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that additional coordination with CDFG will require additional time before a determination can be made.

COMPLIANCE WITH FEDERAL CLEAN WATER ACT AND RIVERS AND HARBORS ACT

A-BIO-5 Prior to the start of any project-related dredging or construction of the intake or outfall structures, the project owner shall submit to the CPM a copy of the U. S. Army Corps of Engineers 404 Permit setting forth the requirements for compliance with the federal Clean Water Act and Rivers and Harbors Act.

Verification: At least 60 days prior to the start of any project-related dredging or in-water construction the project owner shall submit to the CPM a copy of the Corps of Engineers Permit. The Permit terms and conditions will be incorporated into the final BRMIMP and implemented during project construction and operation. For more information about the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP), see Aquatic Biological Resources Condition of Certification **A-BIO-8**, below.

CONSULTATION WITH THE NATIONAL MARINE FISHERIES SERVICE

A-BIO-6 Prior to the start of any project-related dredging or in-water construction, the project owner shall consult with the National Marine Fisheries Service (NMFS) to determine if any measures are necessary to protect the migration of listed salmonid species.

Verification: At least 60 days prior to the start of any project-related dredging or in-water construction the project owner shall submit to the CPM written documentation of consultation with NMFS. If NMFS has identified measures it deems necessary to protect salmonid migration, those measures will be incorporated into the final BRMIMP and implemented during project construction. For more information about the BRMIMP, see Aquatic Biological Resources Condition of Certification **A-BIO-8**, below

ISLAIS CREEK CONTAMINATED SEDIMENTS CONTROL

A-BIO-7 Prior to boring under Islais Creek to install cables, the project owner will submit to the CPM a plan to prevent Islais Creek sediments from contaminating Bay waters in the event of a frac-out.

Verification: At least 60 days prior to any project-related boring under Islais Creek, the project owner shall submit to the CPM for review and approval a plan to prevent Islais Creek sediments from contaminating Bay waters in the event of a frac-out. If a frac-out occurs, the project owner's Construction Manager shall implement the measures in the plan. Within two (2) days following a frac-out during boring under Islais Creek, the project owner shall submit a written report to the CPM documenting the implementation of the plan, explaining any deviation from the plan, and demonstrating the success or failure of the plan to contain Islais Creek sediments.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN

A-BIO-8 The project owner shall submit to the CPM for review and approval a copy of a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP). Any changes made to the adopted BRMIMP must be made in consultation with Energy Commission staff.

Protocol: The final BRMIMP shall identify, but not be restricted to:

1. All biological resources mitigation, monitoring, and compliance conditions included in the Energy Commission's Final Decision;
2. All measures identified by NMFS and CDFG to minimize impacts to aquatic biological resources during dredging and in-water construction;
3. Terms and conditions contained in the projects federal Section 404 Clean Water Act permits and State Section 401 certification;
4. A strategy for any required habitat compensation specified in permits obtained for construction of the new intake and discharge structures; and
5. Duration for each type of monitoring required by the Energy Commission or as a permit condition and a description of monitoring methodologies and frequency.

Verification: At least 60 days prior to the start of any project-related dredging or in-water construction, the project owner shall provide the CPM with the final version of the BRMIMP, and the CPM will determine the plan's acceptability within 15 days of receipt of the final plan. The plan's acceptability will be determined in consultation with all interested state, federal, and local agencies. All consulted agencies must agree that the BRMIMP is final and ready to implement prior to implementation by the project owner. All modifications to the approved BRMIMP must be made after consultation with Energy Commission staff. The project owner shall notify the CPM no less than five (5) working days before implementing any CPM-approved modifications to the BRMIMP.

Within 30 days after completion of dredging and in-water construction, the project owner shall provide to the CPM for review and approval, a written report identifying compliance with the items in the BRMIMP and a summary of all modifications to mitigation measures made during the project's construction phase. The project owner shall also submit to the CPM a report demonstrating compliance with any mitigation for loss of Bay habitat required as a condition of the Section 404/Section 10 permit.

ENTRAINMENT IMPACTS STUDIES

A-BIO-9 The project owner shall complete a full year of studies of ichthyoplankton populations at the intake and in the source water to determine fractional entrainment losses relative to their abundance in the source water.

Protocol: The results of the ichthyoplankton surveys shall be used in an updated 316(b) assessment to determine the entrainment impacts of the new intake. The methods, analysis, results, and conclusions of the monitoring study will be documented in a scientific style report and submitted to the CPM for review and approval. The draft report shall be submitted to the CPM within 120 days following the end of the year's survey or approximately April 2002. A final report shall be prepared within 60 days of receiving comments from CEC and the Agency Working Group for this project.

Verification: The project owner will submit to the CEC CPM a draft report that discusses the results of the entrainment and source water sampling studies within 3 months of the end of field sampling and a final report to the CPM within 6 months from the end of field sampling.

IMPINGEMENT IMPACTS STUDIES

A-BIO-10 The project owner will perform a full year of impingement monitoring at the new combined intake structure for Unit 3 and Unit 7. The project owner will use the results of the impingement study along with those of the entrainment study described in **A-BIO-9** to analyze the impacts of the new intake on fishery resources of San Francisco Bay. If the Hunters Point Power Plant is still in operation when the Potrero PP begins operations, the study will address the cumulative impacts of the intakes of both power plants on aquatic resources.

Protocol: Fish impingement at the new Potrero PP intake shall be monitored monthly following the beginning of Unit 7 operation. Fish impingement losses shall be combined with entrainment losses to determine the impacts of the new intake on aquatic resources. Data analysis protocols should follow those developed from the most recent 316(a) and 316(b) studies at Diablo Canyon, Moss Landing and Morro Bay power plants and the results used to determine the significance of impingement and entrainment losses on fish, shrimp and crab populations. If the Hunters Point Power Plant is still in operation, the study will address the cumulative impacts of both power plants. Protocol and assumptions for the analysis shall be submitted to the CEC CPM and the Agency Working Group for Review within 60 days of project certification.

Verification: The project owner will submit a draft study plan to the CEC CPM within 60 days of project certification for review and approval. Within 90 days of certification, an Agency Working Group and CEC-approved final study plan will be provided to the CEC CPM. The project owner will submit quarterly reports to the

CPM during the study sampling period within 60 days following the completion date of that quarter of field sampling.

The project owner will submit to the CEC CPM a draft report that discusses the results of the impingement, entrainment and source water sampling studies within 3 months of the end of impingement sampling, and a final report to the CEC CPM within 6 months from the end of field sampling.

IMPACTS COMPENSATION

A-BIO-11 If the entrainment and impingement study determines that significant impacts to one or more species of fish or commercially important crab or shrimp is occurring, the project owner will provide funds for mitigation/compensation for impacts to San Francisco Bay aquatic resources. Those funds should be used for some form of aquatic habitat creation or restoration within the San Francisco Bay ecosystem that is sufficient to fully address the species impacts identified in the final report required by Condition of Certification **A-BIO-10**, above. The CEC CPM in consultation with the project owner and the Agency Working Group will determine the amount and final application of those funds. When appropriate mitigation is determined, a Memorandum of Understanding (MOU) will be prepared by the project owner and signed with the entity that will receive the compensation funds. The MOU will clearly identify acceptable uses of the funds, including an accounting of how the funds will be spent.

Verification: The CPM will review the draft MOU to ensure the wording is clear, meets the terms of the mitigation, and that it is enforceable. The CPM and the project owner will ensure the MOU is completed within 120 days of determination of the need for mitigation/compensation. The project owner will provide written verification to the CEC CPM that the mitigation/compensation funds have been paid within 30 days after signing the MOU for the disposition of required compensation funds.

REFERENCES

- Bonnell, M.L. and M. D. Dailey. 1993. Marine Mammals in M.Dailey, D. Reish, and J. Anderson (eds), *Ecology of the Southern California Bight*. University of California Press), Berkeley.
- Carter, H.R., G. J. McChesney, D. L. Jaques, C. S. Strong, M. W. Parker, J. E. Takekawa, D. L. Jory and D. L. whitworth. 1992. Breeding Populations of Seabirds in California 1989-1991 Volume I – Population Estimates. U.S. Fish and Wildlife Service.
- CBE (Communities for a Better Environment). CBE2001DReqCCSF1. Communities for a Better Environment, Data Requests to the City and County of San Francisco, Set 1, Nos. 1 - 27, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to CCSF and docketed with the California Energy Commission, April 06, 2001.
- CCSF (City and County of San Francisco). CCSF2000DReq1. City and County of San Francisco, Data Requests, Set 1, Nos. 1 through 100, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to Southern Energy California, November 17, 2000.
- CEC (California Energy Commission). CEC2000DReq3. California Energy Commission (CEC) staff Data Requests, Set 3, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to Southern Energy California, December 28, 2000.
- CEC (California Energy Commission). CEC2001Req1. California Energy Commission (CEC) staff Data Requests, Set 4, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to Southern Energy California, February 22, 2001.
- CEC (California Energy Commission). CEC 2001 Memo Potrero Power Plant Unit 7 Project (00-AFC-4) – Verification of Fish Data. Submitted to Biology Agency Working Group May 9, 2001.
- CEC/SEP (California Energy Commission/Southern Energy Potrero). 2000. CEC/SEP2000MOU1, Agreement between Southern Energy Potrero And The CEC Staff Regarding Collection Of Validating Data And Assessment Of Biological Impacts Of The Proposed Power Plant Unit 7 Project (00-AFC-4). Filed October 31, 2000.
- Chambers Group. 1994. Environmental Impact Report for Consideration of a New Lease for the Operation of a Crude Oil and Petroleum Product Marine Terminal on state Tide and Submerged Lands at Unocal's San Francisco Refinery Oleum, Contra Costa County prepared for the California State Lands Commission.

- Davis, C. O. 1982. The San Francisco Bay Ecosystem: A Retrospective Overview in W. J. Kockleman, T. J. Conomos, and A. E. Leviton (eds.) San Francisco Bay: Use and Protection. Pacific Division AAAS: 17-37.
- Environmental Protection Agency. 1986. Quality Criteria for Water EPA 440/5-86-001.
- Environmental Protection Agency. 2000. National Pollutant Discharge Elimination System; Cooling Water Intake Structures for New Facilities; Proposed Rules 40 CFR Parts 9, 122, 123 et al Federal Register Vol. 65, No. 155.
- Ford, R. and M.F. Platter-Rieger. 1986. Effects of Underwater Sound from Pile Driving on Behavior of Northern Anchovy (*Engraulis mordax*) and Topsmelt (*Atherinops affinis*) in San Diego Bay. Report to the U.S. Navy.
- Green, D., E. Grigg, S. Allen, and H. Markowitz. 1999. Night Haul Out Patterns of Harbor Seals (*Phoca vitulina richardsi*) at Castro Rocks, San Francisco Bay California. Paper Presented at Wildlife Society western Section 1999 Annual Conference, Monterey, CA, January, 1999.
- McCauley, J.E., R.A. Parr and D.R. Hancock. 1977. Benthic Infauna and Mainenance Dredging: A Case Study. Water Resources II: 233-242.
- MIRANT (Mirant Corp.). MIRANT2001BioSamp1. 2001. January 2001 Biological Sampling Report. Submitted to the California Energy Commission, February 23, 2001.
- MIRANT (Mirant Corp.). MIRANT2001BioSamp2. 2001. February 2001 Monthly Progress Report on the Collection and Processing of Benthic, Plankton, and Trawl Samples. Dated March 28, 2001 and submitted to the California Energy Commission on March 30, 2001.
- MIRANT (Mirant Corp.). MIRANT2001BioSamp3. 2001. [Draft] Three-Month Report on the Benthic, Rocky Shoreline, and Trawl Surveys prepared by Tenera Environmental Services. Submitted to the California Energy Commission, May 8, 2001.
- MIRANT (Mirant Corporation). Mirant2001Dres4. 2001. Mirant Response to Staff Data Requests Set 4, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted March 26, 2001.
- MIRANT (Mirant Corporation). Mirant2001DRespCBE. 2001. Mirant responses to Communities for a Better Environment, Data Requests, Set 1, Nos. 1 - 113, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission April 25, 2001.

MIRANT (Mirant Corporaion). Mirant2001aDResCCSF. 2001. Mirant Responses to City and County of San Francisco, Set1, Nos. 1-100, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted February 1, 2001.

Monroe, M. W. and N. Kelly. 1992. State of the Estuary (San Francisco Estuary Project): A Report on Conditions and Problems in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary.

Moyle, P. B., and R. M. Yoshiyama. 1992. Fishes, Aquatic Diversity Management Areas, and Endangered Species: A Plan to Protect California's Native Aquatic Biota. The California Policy Seminar, University of California.

Moyle, P. B., J.E. Williams, and E.D. Wikramanhyake. 1989. Fish Species of Special Concern in California. State of California, the Resources Agency.

Oliver, J.s., P. N. Slattery, L. W. Hulberg and J. W. Nybakken. 1977. Patterns of Succession in Benthic Infaunal communities following Dredging and Dredged Material Disposal in Monterey Bay. U.S. Army Waterways Experiment Station Technical Report D-77-27: 186 pp.

Ota, B. 2001. California Department of Fish and Game, Personal Communication.

Rosenberg, R. 1977. Effects of Dredging Operations on Estuarine Benthic Macrofauna Marine Pollution Bulletin 8: 102-104.

San Francisco Bay Consevation and Development Commission (BCDC). 1999. *The San Francisco Bay Plan (1969 as Amended)*.

San Francisco Estuary Project. 1991. Status and Trends Report on Pollutants in the San Francisco Estuary. San Francisco Bay-Delta Aquatic Habitat Institute.

San Francisco Estuary Project. 1997. State of the Estuary 1992-1997.

SECAL (Southern Energy California). 2000a. Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, May 31, 2000.

SECAL (Southern Energy California). 2000b. Supplemental Information in Response to CEC Data Adequacy Request, Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, August 31, 2000.

SECAL (Southern Energy California). SEP2001DRes3. Southern Energy California response to staff Data Requests, Set 3, Nos. 162 through 169, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission January 29, 2001.

SECAL (Southern Energy California). SECAL2000Seds1. 2000. Draft Initial Findings Report, Offshore Sediment Sampling, Potrero Power Plant,

September 28, 2000. Submitted to the California Energy Commission,
October 20, 2000.

Small, A. 1994. *California Birds, Their Status and Distribution*. Ibis Publishing Company.

Soule, D. F., M. Oguri and B. H. Jones. 1993. The Marine Environment of Marine del Rey July 1992 to June 1993 and 1976-1993 Summary Harbors Environmental Projects, University of Southern California.

Szczepaniak, I. D. and M. A. Webber. 1985. Status and Distribution of the Harbor Porpoise (*Phocoena phocoena*) in the Eastern North Pacific, with an Emphasis on California. California Academy of Science, San Francisco for the Center for Environmental Education, Washington, D.C.

Thompson, B., S. Lowe, H. Peterson, and M. Kellogg. 1999. Results of the Benthic Pilot Study, 1994-1997 I: Macroenthic Assemblages of the San Francisco Bay-Delta San Francisco Estuary Regional Monitoring Program for Trace Substances Technical Report.

TERRESTRIAL BIOLOGICAL RESOURCES

Shari Koslowsky and Rick York

INTRODUCTION

This section provides the Energy Commission's Preliminary Staff Analysis (PSA) of potential impacts to terrestrial biological resources from the construction and operation of the Potrero Power Plant Unit 7 Project (Unit 7) proposed by Mirant California, LLC (Mirant). This analysis addresses potential impacts to state and federally listed species, species of special concern, and areas of critical biological concern. This analysis also describes the biological resources of the project site and at the locations of ancillary facilities. It also determines the need for mitigation, the adequacy of mitigation proposed by the applicant, and where necessary, specifies additional mitigation measures to reduce identified impacts to less than significant levels. It also determines compliance with applicable laws, ordinances, regulations and standards (LORS), and recommends conditions of certification.

This analysis is based, in part, upon information provided in the Application for Certification (AFC) for the Potrero Power Plant Unit 7 Project (SECAL, 2000a, AFC Section 8.2 and Appendix H), Supplemental Information to the AFC (SECAL, 2000b), various responses to staff data requests, workshops, site visits and discussions with various agency representatives.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

The applicant will need to abide by the following laws, ordinances, regulations, and standards during project construction and operation.

FEDERAL

ENDANGERED SPECIES ACT OF 1973

Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq., designate and provide for protection of threatened and endangered plant and animal species, and their critical habitat. The administering agency is the USFWS.

MIGRATORY BIRD TREATY ACT

Title 16, United States Code, sections 703 - 712, prohibits the take of migratory birds, including nests with viable eggs. The administering agency is the USFWS.

STATE

CALIFORNIA ENDANGERED SPECIES ACT OF 1984

Fish and Game Code sections 2050 et seq. protects California's rare, threatened, and endangered species.

NEST OR EGGS – TAKE, POSSESS, OR DESTROY

Fish and Game Code section 3503 protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs or any bird.

BIRDS OF PREY OR EGGS – TAKE, POSSESS, OR DESTROY

Fish and Game Code section 3503.5 protects California's birds of prey and their eggs by making it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird.

MIGRATORY BIRDS – TAKE OR POSSESSION

Fish and Game Code section 3513 protects California's migratory birds by making it unlawful to take or possess any migratory non-game bird as designated in the Migratory Bird Treaty Act or any part of such migratory non-game bird.

FULLY PROTECTED SPECIES

Fish and Game Code sections 3511, 4700, 5050, and 5515 prohibits take of animals that are classified as Fully Protected in California.

SIGNIFICANT NATURAL AREAS

Fish and Game Code section 1930 et seq. designates certain areas such as refuges, natural sloughs, riparian areas and vernal pools as significant wildlife habitat.

NATIVE PLANT PROTECTION ACT OF 1977

Fish and Game Code section 1900 et seq. designates state rare, threatened, and endangered plants.

CALIFORNIA CODE OF REGULATIONS

Title 14, sections 670.2 and 670.5 list animals of California designated as threatened or endangered.

STREAMBED ALTERATION AGREEMENT

Fish and Game Code section 1601 et seq. regulates activities by public utilities that may divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake designated by the department in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit. A permit may be required from the CDFG for directional boring of Islais Creek; however, because the Creek is cut off upstream from the boring site and is no longer a fresh water flowing water body, this section may not be applicable (Scott Wilson, personal communication, 2001).

LOCAL

CITY AND COUNTY OF SAN FRANCISCO GENERAL PLAN

This Plan provides general objectives and policies towards preservation and protection of biological resources. There are no activities associated with construction or operation of the Plant that affect sensitive habitats, areas or other terrestrial biology issues addressed in this document. However, the following objective and policies generally applicable:

OBJECTIVE 8: ENSURE THE PROTECTION OF PLANT AND ANIMAL LIFE IN THE CITY

This objective and associated policies emphasize the protection of the scarce plant and wildlife communities in the San Francisco area, remaining undeveloped areas and parks, and rare and endangered species.

SUSTAINABILITY PLAN FOR THE CITY AND COUNTY OF SAN FRANCISCO

This advisory document was adopted by the City and County of San Francisco in 1997 and provides goals, objectives and actions for restoring and maintaining biodiversity.

SAN MATEO COUNTY GENERAL PLAN

The natural resources objectives and policies of this Plan are applicable insofar as offsite emissions may affect adjacent sensitive biological resources in San Bruno State and County Park located in San Mateo County.

SETTING

REGIONAL

The proposed project site is located on the western shore of central San Francisco Bay in the City and County of San Francisco, approximately 10 miles north of the San Francisco International Airport. The major project features and actions include:

- demolition of old buildings with the project footprint;
- construction of two gas turbine and one steam generator with transformers and ancillary systems;
- construction of a steam condenser and once through sea water cooling system for Unit 7;
- construction of a new cooling water intake structure to provide condenser cooling water to the new Unit 7 and existing Unit 3 and corresponding discharge system;
- construction of a switchyard for the Potrero Power Plant;
- Construction of 230 kV underground transmission cables to the Hunters Point Substation;
- electrical interconnection of the Potrero Power Plant to PG&E's existing Potrero and Hunters Point Substations;

- interconnection of Unit 7 to an existing PG& E natural gas meter and natural gas supply within the Potrero Power Plant; and
- construction of an aqueous ammonia unloading and storage facility.

In addition, the existing Potrero Unit 3 will be retrofitted with Selective Catalytic Reduction (SCR) emission control equipment and low NO_x burners. Although this is a separate future project that will be undertaken concurrently with the Unit 7 construction, it is relevant to understanding the long term net effects of air emissions from the plant on biological resources.

The site is immediately surrounded on the north, west and south by industrial and commercial land use; however outside this immediate area land use changes to a mixture of residential and commercial. Offsite transmission facilities extend southward through commercial and industrial land use traversing Islais Creek. Within a four mile radius of the plant site Heron's Head Park is located approximately 1.5 miles to the SSE, adjacent to the terminus of the proposed transmission interconnection to the Hunters Point Power Plant; San Bruno Mountain is located approximately 4.5 miles to the SW; and Central San Francisco Bay immediately adjacent to the site. Other small urban parks are located throughout the area.

Historically this region of California that includes the San Francisco Bay area supported several types of vegetation, depending on climate, exposure and topography: salt and brackish marsh, freshwater marsh, grassland, scrub, and chaparral (Sawyer et. al. 1995, USGS, 2000). As previously noted, land use throughout the region beyond the Potrero site is decidedly urban. Native vegetation outside of protected areas persists only as remnants in undeveloped or abandoned lots. All vegetation and wildlife habitat, regardless of the level of whether it is protected, has been impacted or degraded by various anthropogenic factors associated with urban environments, such as invasion by non-native species, noise, alteration of surface drainage and hydrological conditions, soil and air contamination, and other human disturbances.

HERON'S HEAD PARK

Heron's Head Park is a 25-acre peninsula located at the foot of Cargo Way, off of Third Street. The Port of San Francisco created this land, formerly known as Pier 98, in the 1970s by placing fill in the bay with the intention of supporting maritime operations. Although its original purpose was never realized, Heron's Head Park contains approximately eight acres of tidal salt marsh, housing shorebirds and other wildlife and 17 acres of upland habitat. It is one of only a few wetlands located in an industrialized area in the region. (Bubtana 1999)

SAN BRUNO MOUNTAINS

San Bruno Mountains is a 3,600-acre wildlife refuge in a sea of urbanization. At the summit, San Bruno Mountain rises 1,314 feet above sea level with a main ridge extending 4 miles long. It is surrounded on all sides by cities: Daly City, Colma, South San Francisco, and Brisbane. It is home to three rare (two endangered and one threatened) species of butterflies, and 10 species of rare plants.

Conflicting interests for urbanization and habitat conservation were documented in 1983 with adoption of the San Bruno Mountain Area Habitat Conservation Plan that was one of the first plans developed under the Endangered Species Act that allowed "incidental take" of endangered species on private property. The HCP designates 11% (368) acres of the Mountain for planned development; 81% (2,752 acres) for conserved habitat; and 8% (260 acres) subject to further analysis. The factors contributing to the Mountain's high biological diversity are its variable topography and microclimates. The main ridge separates the steeper and dryer southeast slopes from the more gradual and wetter northwest facing slopes. The southeast side is dominated by native and introduced grassland vegetation, while the northwest side is comprised of mostly coastal scrub, and riparian scrub/woodland plant communities. In addition, soils include small patches of serpentine soils. These soils provide harsh conditions for plant growth including low fertility essential to plant growth, and high concentrations of heavy metals that are toxic to most plant life. Despite these conditions, serpentine and other poorly developed soils like those that exist on San Bruno Mountain, support high numbers of rare and/or endemic plant species adapted to tolerate these environments and have been able to persist due to the lack of competition from non-native species that are intolerant to these difficult growing conditions (SFSU, 2001).

SPECIAL STATUS SPECIES

Biological Resources Table 1 lists the sensitive species identified by the California Department of Fish and Game's California Natural Diversity Data Base (CNDDB) as of 4/11/2000 and USFWS as of 4/12/2000 (SECAL, 2000a, AFC, Appendix H) within six miles of the site. These species are geographically depicted in the AFC in Figure 8.2-1. Of these species, only two sensitive plant species, adobe sanicle and alkali milk vetch, are known to occur within a mile of the Unit 7 project site. Occurrence of these plants was referenced by the CNDDB about a half-mile to the west around Potrero Hill.

BIOLOGICAL RESOURCES Table 1
Sensitive Species*
(SECAL 2000a)

Sensitive Plants	Status**
adobe sanicle (<i>Sanicula maritima</i>)	FSC, 1B
alkali milk-vetch (<i>Astragalus tener</i> var <i>tener</i>)	List 1B
beach layia (<i>Lyia carnosa</i>)	FE, CE, List 1B
compact cobwebby thistle (<i>Cirsium occidentale</i> var <i>compactum</i>)	FSC, List 1B
diablo helianthella (<i>Helianthella castanea</i>)	FSC, List 1B
fragrant fritillary (<i>Fritillaria liliacea</i>)	FSC, List 1B
Franciscan manzanita (<i>Arctostaphylos hookeri</i> ssp <i>franciscana</i>)	FSC, List 1A
Kellogg's horkelia (<i>Horkelia cuneata</i> ssp <i>sericea</i>)	FSC, List 1B
Marin western flax (<i>Hesperolinon congestum</i>)	FT, CT, List 1B
Presidio clarkia (<i>Clarkia franciscana</i>)	FE, CE, List 1B
Presidio manzanita (<i>Arctostaphylos hookeri</i> ssp <i>ravenii</i>)	FE, CE, List 1B
robust spineflower (<i>Chorizanthe robusta</i> var <i>robusta</i>)	FE, 1B
round-headed Chinese houses (<i>Collinsia corymbosa</i>)	List 1B
San Bruno Mountain manzanita (<i>Arctostaphylos imbricata</i>)	FSC, CE, List 1B
San Francisco Bay spineflower (<i>Chorizanthe cuspidata</i> var <i>duspidata</i>)	FSC, 1B
San Francisco campion (<i>Silene verecunda</i> ssp <i>verecunda</i>)	FSC, List 1B
San Francisco gumplant (<i>Grindelia hirsutula</i> var <i>maritima</i>)	FSC, List 1B
San Francisco lessingia (<i>Lessingia germanorum</i>)	FE, CE, List 1B
San Francisco owl's-clover (<i>Triphysaria floribunda</i>)	FSC, List 1B
San Francisco popcorn-flower (<i>Plagiobothrys diffusus</i>)	CE

Sensitive Wildlife	Status
Birds	
California black rail (<i>Laterallus jamaicensis coturniculus</i>)	FSC, CT
bank swallow (<i>Riparia riparia</i>)	CT
saltmarsh common yellowthroat (<i>Geothlypis trichas sinuosa</i>)	FSC
Amphibians	
California red-legged frog (<i>Rana aurora draytonii</i>)	FT
Fish	
tidewater goby (<i>Eucyclogobius newberryi</i>)	FE
Invertebrates	
Bay checkerspot butterfly (<i>Euphydryas editha bayensis</i>)	CT
callippe silverspot butterfly (<i>Speyeria callippe callippe</i>)	FE
mission blue butterfly (<i>Icaricia icarioides missionensis</i>)	FE
monarch butterfly (<i>Danaus plexippus</i>)	none
San Bruno elfin butterfly (<i>Incisalia mosii bayensis</i>)	FE
tomales isopod (<i>Caecidotea tomalensis</i>)	CSC

* From the San Francisco North, San Francisco South, Hunters Point and Oakland West USGS quadrangles containing sensitive species location information from the CNDDDB as of 11 May 2000.

** - **Status Legend:** **FE:** Federally Endangered; **FT:** Federally Threatened; **FSC:** Federal Species of Concern; **FPE:** Federal Proposed Endangered; **FPT:** Federal Proposed Threatened; **FC:** Federal Candidate for Listing; **CE:** California Endangered; **CT:** California Threatened; **CPE:** California Proposed Endangered; **CSC:** California Species of Special Concern; **CFP:** California Fully-protected Species; **CR:** California Rare; California Native Plant Society (CNPS) **CNPS List 1A:** Presumed Extinct; **CNPS List 1B:** Rare or endangered in California and elsewhere.

LOCAL DESCRIPTION

The proposed project is located at the intersection of Illinois and 23rd streets in an area currently dominated by industrial and commercial use, with some residential.

Most of the shoreline in this area has been modified with structures for terminal shipping or stabilized with rock or concrete. Prior to this development, the proposed power plant site and surrounding area was likely dominated by grassland, coastal scrub and marsh vegetation.

POWER PLANT SITE AND CONSTRUCTION LAYDOWN AREA

The proposed Potrero Power Plant Unit 7 Project will be an addition to existing generating facilities that will occupy approximately 6.5 acres located in the south-central portion of the 20-acre Plant site between the existing substation and power plant facilities. There is no vegetation located at the proposed power plant site and construction laydown area. A small strip of vegetated area approximately 15 feet wide between the Mirant property and the riprap along the shoreline has been appropriately described in the AFC as disturbed vegetation predominated by non-native species.

TRANSMISSION LINE

The project proposes an underground transmission line to interconnect with PG&E's transmission system. From the existing Potrero Substation located immediately to the west of the Potrero Power Plant the line will extend 1.8 miles to the Hunters Point Substation. The proposed transmission cable route will extend approximately two-thirds of a mile from the site south along existing roads or utility routes and vacant lots. At Islais Creek the line will be installed via underground boring, then continue southeast along Cargo Way to the Hunters Point Substation. Islais Creek is a soft-bottomed channel that has been cut off upstream and is no longer a creek per se, but rather an estuary inlet.

NATURAL GAS SUPPLY PIPELINE

A natural gas pipeline tie-in will be made to an existing PG&E natural gas distribution line located on-site that currently serves the Potrero Power Plant. Therefore, no new lands will be occupied for this purpose outside the existing Potrero property.

COOLING WATER INTAKE/DISCHARGE AND WASTEWATER

A new cooling water intake structure will replace the existing intake and will be constructed at the shoreline adjacent to Unit 3. The circulating cooling water will be discharged via four discharge pipes with diffusion heads that will extend approximately 700 feet offshore from the plant site. Potable water will come from existing supplies. Storm water flows from the Unit 7 area will use the existing surface water drainage system, which will convey the flows to the existing outfalls to the San Francisco Bay and the existing San Francisco City sewer system. Because of its close proximity to the existing shoreline, no new lands will be occupied for these facilities outside the existing Potrero property that will affect terrestrial biological resources.

The construction of the new intake and discharge will result in the loss of coastal habitat, however these impacts will be addressed by the applicant in their Corp of Engineers 404 permit. This issue is discussed in the Aquatic Biological Resources

testimony and will result in habitat compensation. For more information about the project's aquatic biological resources impacts, refer to the Aquatic Biological Resources section.

LOCALLY IDENTIFIED SPECIES

In addition to those sensitive species identified in Table 1 within a six-mile radius of the site, a field survey undertaken by the applicant on March 15, 2000, identified the following plant and animal species within or adjacent to the areas that will be occupied by the proposed Unit 7 project and ancillary facilities (SECAL 2000a, AFC, Table 8.2-1). None of the following plants or animals are identified sensitive species i.e. none are state or federally listed species, plants on the California Native Plant Society lists, etc.

BIOLOGICAL RESOURCES Table 2
Locally Identified Species
(SECAL 2000a)

<u>Scientific Name</u>	<u>Common Name</u>
Plants	
<i>Foeniculum vulgare</i>	fennel
<i>Heterotheca grandiflora</i>	telegraph weed
<i>Stellaria media</i>	common chickweed
<i>Trifolium repens</i>	white clover
<i>Trifolium pratense</i>	red clover
<i>Geranium dissectum</i>	geranium
<i>Oxalis pes-caprae</i>	Bermuda buttercup
<i>Plantago lanceolata</i>	English plantain
<i>Avena</i> sp.	wild oats
Animals	
<i>Actitis macularia</i>	spotted sandpiper
<i>Aechmophorus occidentalis</i>	western grebe
<i>Aythya affinis</i>	lesser scaup
<i>Aythya collaris</i>	ring necked duck
<i>Branta canadensis</i>	Canada goose
<i>Bucephala clangula</i>	common goldeneye
<i>Calidris mauri</i>	western sandpiper
<i>Calidris minutilla</i>	least sandpiper
<i>Casmerodius albus</i>	great egret
<i>Columbia livia</i>	rock dove
<i>Corvus brachyrhynchos</i>	American crow
<i>Egretta thula</i>	snowy egret
<i>Fulica americana</i>	American coot
<i>Larus argentatus</i>	herring gull
<i>Larus californicus</i>	California gull
<i>Melanitta perspicillata</i>	surf scoter
<i>Oxyura jamaicensis</i>	ruddy duck
<i>Phalacrocorax penicillatus</i>	Brandt's cormorant
<i>Podiceps nigricollis</i>	western eared grebe

IMPACTS

DIRECT AND INDIRECT IMPACTS

The California Environmental Quality Act Guidelines defines direct impacts as those impacts that result from the project and occur at the same time and place. Indirect impacts are caused by the project, but can occur later in time or farther removed in distance, but are still reasonably foreseeable and related to the project. The potential impacts discussed below are those most likely to be associated with construction and operation of the project. None of the impacts described below are considered significant, however staff has proposed a condition of certification to address concerns.

POWER PLANT SITE AND LAYDOWN AREA

DISTURBANCE OR REMOVAL OF EXISTING VEGETATION

The Unit 7 Project site and construction laydown area are contained within the existing Mirant power plant property; therefore there will be no disturbance or removal of vegetation in this area.

BIRD COLLISIONS WITH EXHAUST STACKS

Two 180-foot exhaust stacks will be constructed next to the existing 291-foot stack. Bird collisions with exhaust stacks and other tall structures can result in significant bird losses when these structures are located in areas where suitable habitat attracts bird populations. Most bird collisions/deaths occur during migration in inclement weather. The collisions involve primarily night-migrating songbirds such as warblers, thrushes, vireos, tanagers, cuckoos, and sparrows.

There is very little shrub and tree vegetation in the project area that would provide suitable habitat for these species. Migratory waterfowl will use the entire shore area, at least for resting and foraging; however there are no significant waterfowl resource areas near the plant that would attract large numbers of birds, included threatened or endangered bird species. Therefore, staff concludes that this potential concern is not applicable to the Potrero Unit 7 project, so no mitigation is recommended.

NOISE

The combined steady state sound level from the various components of Unit 7 at 400 feet were estimated at 58 dBA. It was projected that at that distance from the site no human noise-sensitive receptors would be affected by a 5 dBA increase above existing noise levels. In addition, the project has been designed to conform to applicable noise LORS during construction and operation. Given the existing and projected sound levels during construction and operation, as well as the absence of threatened and endangered species at the site or other important biological resources within the area surrounding the plant, noise level impacts to the local biota during construction and operation of the plant will be insignificant, so staff has not proposed any conditions of certification.

NITROGEN AND SULFUR EFFECTS ON BIOTA

The effect of air emissions on biological resources has been well studied in the case of acid producing emissions of sulfur dioxide (SO₂) and nitrous oxides (NO_x). However, there are many other changes in ecological processes that can be induced by primary air contaminants that have not been studied either because of the uncertainty and complexity inherent in quantitative analysis or because up until now the potential effects have been deemed relatively insignificant. It is generally assumed that the direct health effects of contaminated air on wildlife are adequately addressed by human based criteria, which is not always the case because of gross differences in exposure pathways and animal physiology (Freedman, 1989 and USEPA, 1989); however, because the nearest significant terrestrial biological receptors for the Potrero site (i.e., San Bruno Mountain and Heron's Head Park) are located to the south, outside the predominant plume direction, the measures taken to address protection of human receptors (see Public Health section) would be sufficient to protect terrestrial wildlife in these areas from direct health effects.

Staff also considered the indirect effects of emissions on ecological processes that can eventually impact plants and animals. These effects are difficult to quantify because they are influenced by a myriad of physical and biological factors that have not been fully characterized and that require assumptions, which may tend to overestimate (or underestimate) impacts (Stockwell, 2000). Nevertheless, staff addressed the potential for dry and wet deposition of sulfur (S) and nitrogen (N) to affect the sensitive environment of San Bruno Mountain described above.

Currently one of the best studied of these potential effects in the Bay area is the effect of N deposition on nutrient poor serpentine habitats. Of the biological resources in the area surrounding the Unit 7 project site, the San Bruno Mountains support some of the few remaining remnants of serpentine habitat in the Bay area. Although this site is not considered to be a significant area for serpentine soils (Weiss, personal communication, 2000), the San Bruno Mountains have been included in the Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area (USFWS, 1998). In addition to the mission blue butterfly, (*Plebejus icarioides missionensis*, federally listed Endangered) the mountain is host to the federally listed Endangered San Bruno elfin butterfly (*Incisalia mossi bayensis*), and the federally listed Endangered callipe silverspot butterfly (*Speyeria callippe callippe*), and was historically inhabited by the Bay checkerspot butterfly (*Euphydryas editha bayensis*, California listed Threatened), a species dependent on serpentine habitats.

The biological communities that exist on San Bruno Mountain are affected by indirect impacts to the physical environment that alter the quality of habitat resources. Among these, are changes in soil chemistry induced by dry and wet N deposition, and to a lesser degree S deposition that can in turn affect the composition of the biological community and biodiversity.

Assessing the impacts of N deposition as it relates to changes in soil fertility and the presence of endemic vegetation associated with state and federally listed animal species has been included among proposed measures for habitat restoration and

management of serpentine habitats in the Bay area. The relationship between N deposition and alteration of grassland habitat and removal of grazing has also been studied by Weiss (1999) for the Bay checkerspot butterfly and by Allen et al. (1998) in coastal sage vegetation.

Staff was concerned that N deposition rates at sensitive biological receptors could be significant enough to alter native plant communities. The applicant in its response to CEC data requests (SECAL, SEP 2000 Data Request Set 1, Data Response Nos. 20 to 22) calculated that the maximum deposition rates for S and N at the nearest sensitive biological receptors are those listed in Table 3 below for Unit 7 alone. These values were compared to United States Forest Service (USFS) significance criteria for Class I wilderness areas in kg/ha-y. The predominant wind direction and plume direction for annual SO₂ and NO₂ concentrations is indicated to the NE of the project site in Figures 8.1-12 and 8.1-18, respectively of the AFC (SECAL, 2000a), which is not in the direction of the sensitive terrestrial biological receptors at San Bruno Mountain and Heron's Head Park.

BIOLOGICAL RESOURCES Table 3
Nitrogen (N) and Sulfur (S) Deposition Rates (kg/ha-yr) at Sensitive Biological Receptors (SECAL, 2000c)

Pollutant/Location	USFS Significance Level¹	Project Impact (kg/ha-yr)
Total S - San Francisco Bay	5	0.72
Total S - Heron's Head Park	5	0.13
Total S - San Bruno Mountain	5	0.05
Total N – San Francisco Bay	3	1.27
Total N – Heron's Head Park	3	0.28
Total N – San Bruno Mountain	3	0.10

¹Peterson et al., 1992.

These USFS values are applied to Class I wilderness areas defined as those with more than 5,000 acres that were in existence as of August 7, 1977, or any later expansions made to these wildernesses. They were derived in order to comply with provisions of the Clean Air Act of 1977. However, the values themselves are generic condition classes set for ecosystem impacts to different vegetation types in California and can ostensibly be used for other areas. At levels less than those defined above, no injury is expected. Injury in this case is defined broadly at the ecosystem level to collectively include processes such as plant metabolism and deposition effects on vegetation structure and diversity. The deposition rates provided in Table 3 above are 1 to 2 orders of magnitude less than the significance level generically defined for detrimental effects to shrubs and herbaceous plants and far below the levels of 10 – 15 kg/ha-yr deemed significant in Weiss's (1999) study of the impacts of N deposition on increases in soil fertility, which encourages invasion of non-native grasses and reduction in habitat suitability for the Bay checkerspot butterfly.

Moreover, concurrent with the development of Unit 7, Potrero Unit 3 is being fitted with Selective Catalytic Reduction (SCR) emission control technology, which will

reduce NO_x emissions by greater than 90% (SECAL, SEP 2000 Data Response Set 1, Data Response No. 21). Therefore, under the conditions described by the applicant in their response, there will actually be a net improvement in the potential impacts of N deposition from this source (Units 3 and 7) and no significant impacts are expected to occur.

TRANSMISSION LINE

The proposed transmission line would traverse areas that have already been disturbed by existing urban facilities, with the exception of Islais Creek. Directional boring will enter and exit approximately 180 feet from the channel outside of the vegetated strips along both banks, although the drilling area may extend to 170 feet from the channel. The patches of vegetation that exist among the rip rap along the banks provides some resting area for waterfowl that use the creek; however it does not contain any sensitive plant species. During construction there will be a disturbance to waterfowl that use this area; however this impact will be temporary and will not affect any threatened or endangered species. Therefore, significant impacts to biological resources in this area, including threatened and endangered species, are not expected to occur.

NATURAL GAS PIPELINE

Given that existing structures will be relied on for gas delivery; there will be no disturbance or removal of vegetated areas and therefore, no significant impacts to biological resources.

CUMULATIVE IMPACTS

The California Environmental Quality Act defines cumulative impacts as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.” (CEQA Guidelines, Cal. Code Regs., Title 14, §15355). Cumulative impacts can occur when individually minor but collectively significant projects take place at nearly the same time frame or compound over time.

Presently staff believes that the Potrero Power Plant Unit 7 Project will not contribute to significant cumulative impacts to terrestrial biological resources. However, given the projected growth for power generating facilities in the San Francisco Bay area, along with other sources of the major contaminants of concern associated with these facilities, the long term cumulative effects of emissions on biota and ecological processes, both in the terrestrial and aquatic environments, should not be discarded by the applicant in their environmental management efforts and will be the subject of continued study by biology staff.

MITIGATION

APPLICANT’S PROPOSED MITIGATION

Because the applicant did not identify significant impacts to terrestrial biological resources, impact avoidance or other mitigation measures were not proposed.

STAFF'S RECOMMENDED MITIGATION

Although the applicant does not propose to disturb or remove vegetation for construction or operation of the Potrero Power Plant and ancillary facilities, in the event that these activities do affect adjacent vegetated areas, revegetation or landscaping of the project site should use only native vegetation that is suitable to the site, in compliance with the goals and policies set forth in the City and County of San Francisco's General Plan.

Staff currently believes that no mitigation is required to address the direct or indirect effects of air emissions on biota from Unit 7. This determination is based on the conditions provided in Table 21-1 of the Applicant's response to data requests that assumes retrofit of Unit 3 (SECAL, SEP 2000 Data Response Set 1, Data Response Nos. 20 to 22). Even though the Unit 7 project would contribute 0.10 kg/ha-yr¹ to the N deposition rates at San Bruno Mountain, staff feels that this impact would be adequately compensated by the reductions in NO_x emissions from the Unit 3 retrofit.

Staff has concluded that the applicant may need to acquire a Streambed Alteration Agreement from the California Department of Fish and Game prior to transmission line directional boring work under Islais Creek. See Biological Resources Conditions of Certification **T-BIO-1**.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

The applicant may be required to get a Streambed Alteration Agreement from the California Department of Fish and Game (CDFG) for directional boring beneath Islais Creek. See Biological Resources Condition of Certification **T-BIO-1**.

CONCLUSIONS, UNRESOLVED ISSUES, AND RECOMMENDATIONS

Construction and operation of the Unit 7 project should not have significant impacts on terrestrial biological resources if staff's proposed mitigation measures are implemented by the project owner.

CONCLUSIONS

To address staff's concerns, staff has proposed that a condition of certification be required.

RECOMMENDATION

Staff recommends that the following Terrestrial Biological Resources Condition of Certification be implemented.

¹ As a point of reference, deposition rates of 0.13 kg-ha/yr on Coyote Ridge near the Metcalf Energy Center (MEC) represented 1.55% of ambient levels and were considered significant. The Metcalf Project is proposed to be located in the Santa Clara Valley within the Urban Service Area of south San Jose and just north of the town of Coyote.

CONDITIONS OF CERTIFICATION

Staff proposes the following condition of certification:

CALIFORNIA DEPARTMENT OF FISH AND GAME STREAMBED ALTERATION AGREEMENT

T-BIO-1 If necessary, the project owner will acquire a CDFG Streambed Alteration Agreement to address any CDFG concerns regarding directional drilling beneath Islais Creek. The project owner must implement the terms and conditions of the agreement during project construction to avoid potential impacts to Islais Creek.

Verification: Within 45 days of the date of project certification, the project owner will provide the CPM with a copy of the final CDFG Streambed Alteration Agreement for the Potrero Unit 7 Project. The agreement's terms and conditions will be incorporated into the project's construction plans and implemented during project construction to avoid potential impacts to Islais Creek.

REFERENCES

- Allen, E.B., P. A. Padgett, A. Bytnerowicz and R. A. Minnich. 1998. Nitrogen Deposition Effects on Coastal Sage Vegetation of Southern California. General technical report (PSW-GTR)-166. Pacific Southwest Experimental Station, U.S. Forest Service, Riverside, California.
- Bubtana, Aida. 1999. Hunters Point Welcomes Preservation Park, The Guardsman Online, City College of San Francisco.
<http://www.ccsf.cc.ca.us/Guardsman/f991025/news04.shtml>. October 1999.
- CNDDDB. 2000. California Natural Diversity Database results for May 2000 from the San Francisco North, San Francisco South, Hunters Point and Oakland West quadrangles.
- SECAL (Southern Energy California). 2000a. Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, May 31, 2000.
- _____. 2000b. Supplemental Information in Response to CEC Data Adequacy Request, Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, August 31, 2000.
- _____. SEP2000DRes1. Southern Energy California response to staff Data Requests, Set 1, Nos. 1 through 139, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission on December 7, 2000.
- Freedman, Bill. 1989. Environmental Ecology. Academic Press. Pgs. 424.
- Peterson, David L., Daniel L. Schmoltdt, Joseph M. Eilers, Richard W. Fisher, Robert D. Doty. 1992. Guidelines for Evaluating Air Pollution Impacts on Class I wilderness Areas in California. Gen. Tech. Rep. PSW-GTR-136. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture, 34 p.
- Sawyer, J. O. and T. Keeler-Wolf. 1995. A Manual of California Vegetation. California Native Plant Society, Sacramento, CA. Pgs. 471.
- Stockwell, William R. 2000. Deposition Estimates for PG&E Generating Company Power Plant at Otay Mesa. Prepared for PG&E Generating Company.
- SFSU. <http://thecity.sfsu.edu/users/HCP/#Wildlife>. Website for information regarding San Bruno Mountain as of May, 2001.
- USEPA. 1989. Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference. EPA 600/3-89/013. Environmental Research Laboratory, Corvallis, OR.

USGS. 1998 and 2000. Gap Analysis Program (GAP) and California Gap Analysis Project (CA-GAP) produced by UCSB under contract to USGS.

Weiss, Stuart B. 1999. Cars, Cows and checkerspot Butterflies: Nitrogen Deposition and Management of Nutrient-Poor Grasslands for a Threatened Species. *Conservation Biology*, Vol. 13, No. 6.

Weiss, Stuart B. 2000. Personal communication to Shari Koslowsky of Aspen Environmental Group regarding the significance of N deposition impacts at San Bruno Mountain from the Potrero Power Plant. Tel.: 650 854 9732.

Wildbirds. www.wildbirds.com/protect_towers.htm. Website regarding bird collisions with towers as of May, 2001.

Wilson, Scott. 2001. Personal communication to Joe Crea of Aspen Environmental Group regarding the need for compliance with Stream Alteration Agreement requirements at Islais Creek. California Department of Fish and Game, Central Coast Region. Telephone: 707 944 5584.

CULTURAL RESOURCES

Gary Reinoehl and Roger Mason

INTRODUCTION

This analysis discusses cultural resources, which are defined as the structural and cultural evidence of the history of human development and life on earth. Evidence of California's early occupation is becoming increasingly vulnerable due to the ongoing development and urbanization of the state.

Cultural resource materials may be found nearly anywhere in California: along the ocean coastline and on coastal islands, along rivers and streams, in coastal and inland valleys and lowlands, throughout the coastal and inland mountain ranges, and throughout the interior deserts. Cultural resources may be found on the ground or may be found at varying depths beneath the surface. In some areas of the state, a sequence of settlements on the same site may cover multiple layers of cultural resources. In other areas, the distribution of cultural materials may be much more dispersed and seemingly unrelated.

Cultural resources are significant to our understanding of our culture, history, and heritage. Critical to the analysis of cultural resources are the spatial relationships between an undisturbed cultural resource site and the surface environmental resources and features, and the analysis of the locational context of the resource materials within the site and beneath the surface. These relationships provide information that can be used to piece together the sequence of human occupation and use of an area, and they begin to create a picture of the former inhabitants and their environment.

Staff's primary concerns in its cultural resource analysis are to ensure that all potential impacts are identified, and that conditions are set forth that ensure no significant adverse impacts will occur. The identification of potential impacts to cultural resources from the proposed Potrero Power Plant Project (Unit 7) is required by the Siting Regulations of the California Energy Commission (Energy Commission) and by the California Environmental Quality Act (CEQA). Three aspects of cultural resources are addressed in staff's analysis: prehistoric archaeological resources, historic archaeological resources, and ethnographic resources.

PREHISTORIC RESOURCES

Prehistoric archaeological resources are those materials relating to prehistoric human occupation and use of an area; these resources may include sites and deposits, structures, artifacts, rock art, trails, and other traces of Native American human behavior. In California, the prehistoric period began over 10,000 years ago and extended through the 18th century when the first Euro-American explorers settled in California.

HISTORIC RESOURCES

Historic archaeological resources are those materials usually associated with Euro-American exploration and settlement of an area and the beginning of a written historical record; they may include archaeological deposits, sites, structures, traveled ways, artifacts, documents, or other evidence of human activity. Under federal and state requirements, cultural resources must be greater than fifty years old to be considered of potential historical importance.

ETHNOGRAPHIC RESOURCES

Ethnographic resources are those materials important to the heritage of a particular ethnic or cultural group, such as Native Americans or African, European, or Asian immigrants. They may include traditional resource collecting areas, ceremonial site, topographic features, cemeteries, shrines, or ethnic neighborhoods and structures.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Cultural resources are indirectly protected under provisions of the federal Antiquities Act of 1906 (Title 16, United States Code, Section 431 et seq.) and subsequent related legislation, policies, and enacting responsibilities, e.g., federal agency regulations and guidelines for implementation of the Antiquities Act. The following laws, ordinances, regulations, standards, and policies apply to the protection of cultural resources in California. Projects licensed by the Energy Commission are reviewed to ensure compliance with these laws.

FEDERAL

- National Environmental Policy Act (NEPA): Title 42, United States code, section 4321-et seq., requires federal agencies to consider potential environmental impacts of projects with federal involvement and to consider appropriate mitigation measures.
- Federal Land Policy and Management Act (FLPMA): Title 43, USC, section 1701 et seq., requires the Secretary of the Interior to retain and maintain public lands in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric water resource, and archeological values [Section 1701(a)(8)]; the Secretary, with respect to the public lands, shall promulgate rules and regulations to carry out the purposes of this Act and of other laws applicable to public lands [Section 1740].
- Federal Register 44739-44738, 190 (September 30, 1983): Federal Guidelines for Historic Preservation Projects: The US Secretary of the Interior has published a set of Standards and Guidelines for Archaeology and Historic Preservation. These are considered to be the appropriate professional methods and techniques for the preservation of archaeological and historic properties. The Secretary's standards and guidelines are used by federal agencies, such as the Forest Service, the Bureau of Land Management, and the National Park Service. The State Historic Preservation Office refers to these standards in its requirements for selection of qualified personnel and in

the mitigation of potential impacts to cultural resources on public lands in California.

- National Historic Preservation Act, 16 USC 470, commonly referred to as Section 106, requires federal agencies to take into account the effects of their undertakings on historic properties through consultations beginning at the early stages of project planning. Regulations revised in 1997 (36 CFR Part 800 et. seq.) set forth procedures to be followed for determining eligibility for nomination, the nomination, and the listing of cultural resources in the National Register of Historic Places (NRHP). The eligibility criteria and the process are used by federal, state, and local agencies in the evaluation of the significance of cultural resources. Very similar criteria and procedures are used by the state in identifying cultural resources eligible for listing in the State Register of Historic Resources. Recent revisions to Section 106 in 1999 emphasized the importance of Native American consultation.
- Executive Order 11593, "Protection of the Cultural Environment," May 13, 1971 (36 Federal Register 8921), orders the protection and enhancement of the cultural environment through providing leadership, establishing state offices of historic preservation, and developing criteria for assessing resource values.
- American Indian Religious Freedom Act; Title 42, United States Code, Section 1996 protects Native American religious practices, ethnic heritage sites, and land uses.
- Native American Graves Protection and Repatriation Act (1990); Title 25, United States Code Section 3001, et seq., defines "cultural items", "sacred objects", and "objects of cultural patrimony"; establishes an ownership hierarchy; provides for review; allows excavation of human remains, but stipulates return of the remains according to ownership; sets penalties; calls for inventories; and provides for the return of specified cultural items.

STATE

- Public Resources Code, Section 5020.1 defines several terms, including the following:
 - (j) "historical resource" includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.
 - (q) "substantial adverse change" means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired.
- Public Resources Code, Section 5024.1 establishes a California Register of Historical Resources; sets forth criteria to determine significance; defines eligible properties; and lists nomination procedures.

- Public Resources Code, Section 5097.5 states that any unauthorized removal or destruction of archaeological or paleontological resources on sites located on public land is a misdemeanor. As used in this section, “public lands” means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.
- Public Resources Code, Section 5097.98 defines procedures for notification of discovery of Native American artifacts or remains and for the disposition of such materials.
- Public Resources Code, Section 5097.99 prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn and sets penalties for these actions.
- Public Resources Code, Section 5097.991 states that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated.
- Public Resources code, Section 21000, et seq, California Environmental Quality Act (CEQA), requires the analysis of potential environmental impacts of proposed projects and requires application of feasible mitigation measures.
- Public Resources Code, Section 21083.2 states that if a project may affect a resource that has not met the definition of an historical resource set forth in section 21084, then the lead agency may determine whether a project may have a significant effect on “unique” archaeological resources; if so, an EIR shall address these resources. If a potential for damage to unique archaeological resources can be demonstrated, such resources must be avoided; if they can not be avoided mitigation measures shall be required. The law also discusses excavation as mitigation; discussed the costs of mitigation for several types of projects; sets time frames for excavation; defines “unique and non-unique archaeological resources; provides for mitigation of unexpected resources; and sets financial limitations for this section.
- Public Resources Code, Section 21084.1 indicates that a project may have a significant effect on the environment if it causes a substantial adverse change in the significance of a historic resource; the section further defines a “historical resource” and describes what constitutes a “significant” historical resource.
- CEQA guidelines, Title 14, California Code of Regulations, Section 15126.4 “Consideration and Discussion of Mitigation Measures Proposed to Minimize Significant Effects” sub-section (b) discusses impacts of maintenance, repair, stabilization, restoration, conservation, or reconstruction of a historical resource. Subsection (b) also discusses mitigation through avoidance of damaging effects on any historical resource of an archaeological nature, preferably by preservation in place, or by data recovery through excavation if avoidance or preservation in place is not feasible. Data recovery must be conducted in accordance with an adopted data recovery plan.
- CEQA Guidelines, Title 14, California Code of Regulation, Section 15064.5 “Determining the Significance of Impacts to Archaeological and Historical Resources”. Subsection (a) defines the term “historical resources.” Subsection (b) explains when a project may be deemed to have a significant effect on

historical resources and defines terms used in describing those situations. Subsection (c) describes CEQA's applicability to archaeological sites and provides a bridge between the application of the terms "historical" resources and a "unique" archaeological resource.

- CEQA Guidelines, Title 14 California Code of Regulations, Section 15064.7 "Thresholds of Significance." This section encourages agencies to develop thresholds of significance to be used in determining potential impacts and defines the term "cumulatively significant."
- California Penal Code, Section 622.5. Anyone who willfully damages an object or thing of archaeological or historic interest can be found guilty of a misdemeanor.
- California Health and Safety Code, Section 7050.5. If human remains are discovered during construction, the project owner is required to contact the county coroner.
- Public Resources Code, Section 5097.98. If the county coroner determines that the remains are Native American, the coroner is required to contact the Native American Heritage Commission, which is then required to determine the "Most Likely Descendant" to inspect the burial and to make recommendations for treatment or disposition of the remains and any associated burial items.

LOCAL

Although the Energy Commission has pre-emptive authority over local laws, it typically ensures compliance with local laws, ordinances, regulation, standards, plans, and policies.

CITY OF SAN FRANCISCO

The City of San Francisco's Master Plan, General Plan, and Planning Codes do not contain specific City policies that address management of cultural resources. However, the City's Planning staff ensures compliance with CEQA.

ENVIRONMENTAL SETTING

REGIONAL DESCRIPTION

The project area is located on the San Francisco Peninsula, a northward extension of the Santa Cruz Mountains that separates San Francisco Bay from the Pacific Ocean. The project area is an industrial area within the City of San Francisco.

PROJECT VICINITY DESCRIPTION

The project is located on Potrero Point on the western shoreline of San Francisco Bay about 1.5 miles south of the Bay Bridge. Potrero Hill rises to an elevation of about 300 feet, one half mile west of the project. The project area is industrial with the former Pier 70 shipyard complex to the north and warehouses to the south. Another warehouse separates the project from a residential area at the base of

Potrero Hill known as the Dogpatch Neighborhood. The project area is developed and covered by buildings and pavement.

Refer to the **PROJECT DESCRIPTION** section of this Preliminary Staff Assessment for additional information and maps of the project development region and the project area.

PREHISTORIC SETTING

The earliest documented occupation of the area between San Francisco and Monterey Bays dates to about 8,000 Before Present (BP). Prior to 2,000 BP archaeological evidence indicates that this area was occupied by small groups of hunter-gatherers that exploited both terrestrial and marine resources (primarily shellfish). Large shellmound sites began to be occupied around San Francisco Bay around 2,500 BP. These sites appear to be habitation sites with dense shell midden, flaked and ground stone tools, bone tools, beads, ornaments, charmstones, and burials. The shellmound sites were occupied until the arrival of the Spanish. The principal marine resource exploited was shellfish, consisting mostly of oysters and bentnose clams. The most important terrestrial resource was acorns gathered from oak trees in the fall. Acorn processing (leaching out the tannic acid and grinding into meal) requires a significant amount of labor. Use of acorns as early as 2,500 BP indicates intensification of resource procurement at a relatively early period in prehistory in this area. The beginning of the use of the shellmound sites around San Francisco Bay may correspond with the arrival of Utian speaking people from the Delta area. These Utian speakers were the ancestors of the Costanoans who occupied the San Francisco Bay area when the Spanish arrived in the area.

ETHNOGRAPHIC BACKGROUND

The project area is in territory occupied by the Native American group known to the Spanish and twentieth century ethnographers as the Costanoan. The contemporary descendants of this group are members of the Ohlone Indian Tribe. The Costanoan group occupied the coast of California from San Francisco to Monterey and inland to include the coastal mountains from the southern side of the Carquinez Straits to the eastern side of the Salinas River south of Chalone Creek. Costanoan actually refers to a language family consisting of eight related languages. Each language was spoken by a different ethnic group within a recognized geographical area. The political units within each ethnic group were tribelets. Tribelet population varied from 50 to 500 with the average being about 200 people. Each tribelet had one or more permanent villages and several temporary camps within its territory. Collecting and hunting parties lived in temporary camps when obtaining resources within the tribelet territory away from the village.

The project area is in the area occupied by speakers of the Ramaytush language. It is estimated there were about 1,400 speakers of this language in 1770. The Ramaytush speakers were divided into at least 10 tribelets.

Each tribelet had a chief and the office was inherited patrilineally. In particular, the chief fed visitors, directed ceremonial activities, organized hunting, fishing, and

gathering, and directed warfare expeditions. Trade between the coastal Costanoan groups and the inland Yokuts groups involved the exchange of coastal products, such as mussels, abalone shells, dried abalone meat, and salt for inland products, such as piñon nuts.

Acorns from four species of oak were the most important plant food. Nuts, berries, seeds, and roots were also important. Costanoan groups practiced managed burning of chaparral to encourage sprouting of seed plants and improve browsing for deer and elk. The most important animals consumed were deer and rabbit. Steelhead, salmon, sturgeon, and lampreys were the most important fish and oysters and clams were the most important shellfish gathered from San Francisco Bay.

People lived in thatched dome houses with rectangular doorways and a central hearth. Other structures in a village included sweathouses, dance enclosures, and an assembly house. Technology included tule balsa canoes, bows and arrows, and baskets. Chipped stone tools were made from chert obtained locally and obsidian obtained in trade with other groups.

Seven missions were established by the Spanish in Costanoan territory between 1770 and 1797. Due to introduced European diseases and a declining birth rate, the Costanoan population decreased from about 10,000 to 2,000 by 1832.

HISTORIC SETTING

Spanish missionaries began their exploration and development of the missions in California in 1769, starting in San Diego and ending with the missions in San Rafael and Sonoma, in 1823. Mission San Francisco and the San Francisco Presidio (military post) were established in 1776. The missions were closed by the Mexican government in the early 1830s. Former mission lands were granted to soldiers and other Mexican citizens for use as cattle ranches. Ranching continued during the American period that began when the Treaty of Guadalupe Hidalgo was signed between Mexico and the United States in 1848. The Gold Rush of 1849 brought large numbers of Anglo-Americans to the area, resulting in the rapid expansion of San Francisco which became the commercial entrepot for the region. Other towns in the bay area, such as Oakland and San Jose, developed rapidly after the arrival of the transcontinental railroad in 1869. The bay area towns provided commercial, warehousing, financial, and manufacturing services for the agricultural and mining areas further east. The earthquake of 1906 destroyed many nineteenth century buildings, especially in San Francisco, and resulted in a period of reconstruction and expansion of structures and infrastructure in the 1910s and 1920s.

The Potrero Point area was the site of early industrial activity associated with San Francisco. Between 1850 and 1950 there were powder magazines, a sugar processing plant, an electrical generating plant, a gas manufacturing plant, and a major shipyard within the immediate vicinity of the project area.

The first structures built at Potrero Point appear to have been powder magazines for the storage of gunpowder or blasting powder. Gibbon's Powder Magazine was

established at Potrero Point at a location in the current project area in the late 1850s and consisted of a brick powder magazine, a dwelling, and a wharf (SEP2000Dres2, Data Response No. 155). The Hazard Powder Magazine was established nearby, but outside the current project area. There are reports that a Chinese fishing village was located at Potrero Point during the 1880s, but there is no specific information as to its location.

The California Sugar Refinery was established at Potrero Point in 1881 by Claus Spreckles. Construction of this facility likely resulted in the partial destruction and burial of the powder magazine. The sugar refinery was established to refine and produce sugar made from Hawaiian sugar cane. It became the largest sugar refinery in the western United States and was a major industrial facility. Pre-1914 structures included several multi-story brick structures that served as a melt wash house, a melt filter house, warehouses, and wharves. The refinery was renamed the Western Sugar Refinery and operated until 1949 when it was purchased by its major competitor, the California and Hawaiian Sugar Refining Corporation (C & H). Most of the refinery structures were later demolished (SECAL2001b Appendix R3).

In 1901 Spreckles built Station A, a large brick structure that housed a steam powered electrical generating plant. It was soon purchased by San Francisco Gas & Electric which was renamed Pacific Gas & Electric. Station A was the largest steam electric plant west of the Rocky Mountains between 1903 and 1913 and supplied almost all of San Francisco's electricity during this period. Later, when cheaper hydroelectric power became available, Station A was used to supplement the hydroelectric power during periods of peak use. With continuing equipment upgrades Station A remained in operation until 1983 (SECAL2001b Appendix R2).

Before electricity was generally available, gas was used for lighting. Gas was manufactured from coal or oil until natural gas became available in 1929. The first gas manufacturing plant was established at Potrero Point by the City Gas Company in 1872. Ownership was transferred to San Francisco Gas & Electric in 1897. This company became Pacific Gas & Electric in 1906. The Potrero gas plant was one of two in the city that survived the 1906 earthquake and was expanded as the city was rebuilt. The Potrero gas plant was converted from using coal to oil in 1906. The Potrero gas plant was placed on standby status from 1929 to 1960. Most of it was subsequently demolished (SECAL2001b Appendix R2).

The San Francisco Yard (shipyard) is located adjacent to the project area to the north. It began as two competing companies that operated side by side. Union Iron Works was established in 1883 and built ships used in the Spanish American War, including Admiral Dewey's flagship. Pacific Rolling Mills was established in 1896. By 1911 both shipbuilding operations had been purchased by Bethlehem Steel and were run as one large consolidated facility. Numerous warships used in both World War I and World War II were built at the San Francisco Yard. Bethlehem Steel operated the Yard until 1949 (SECAL2001b Appendix R1).

The underground transmission line proposed as part of the project passes through what was formerly Islais Creek Cove (now filled in). "Butchertown" was located south of Cargo Way and was built on platforms and wharves supported by pilings in

the cove. This area contained slaughterhouses, stables, offices, saloons, and boarding houses. Butchertown was established by the meat processing firm of William Dunphy and Associates in 1871 and continued in operation until 1906 when it was destroyed during the earthquake. This part of the cove was later filled (URS/Dames & Moore 2000:5).

In 1909 the Western Pacific Railroad built a 1,500 foot long wharf with track extending from the end of 25th Street (at Illinois Avenue at that time) in the area north of Islais Creek. The wharf was built to facilitate transport of rail cars across the bay to Oakland. The area around the wharf was later filled and reclaimed, but the wharf and tracks continued in operation until 1978.

RESOURCES INVENTORY

LITERATURE AND RECORDS SEARCH

Prior to preparation of the AFC, consultants to the applicant conducted a literature search and reviewed site records and maps at the Northwest Information Center of the California Historic Resources Information System (CHRIS). A second records search was obtained in early 2001. The records searches did not identify any previously recorded prehistoric cultural resources within one quarter mile of the proposed project (the power plant and the underground transmission line route). The records search indicated that two previous cultural resources investigations covered the current project area. One of these was a study by Wirth Associates (1979) for an earlier expansion of the Potrero Power Plant. Part of the brick foundation of one of the mid-nineteenth century powder magazines discussed in the Historic Setting section was found in a trench excavated in the northeastern part of the power plant (an area that will not be affected by the proposed project). This feature was not included in the records search results, indicating that a site record form had not been submitted to the information center.

A second cultural resources study was prepared for the 1998 EIR for the sale of PG&E power plants that included the Potrero Power Plant. This study did not identify any archaeological resources in the project area, but concluded that there was a low to moderate potential for buried prehistoric resources and a moderate to high potential for buried historic resources. The second records search identified several industrial buildings more than 50 years old in the project vicinity, mostly located west of Third Street. In addition, the I. M. Scott School, built in 1895 and located at 1060 Tennessee Street, is San Francisco Historical Landmark 138 (SEP2000Dres2, Data Response No. 152).

An additional records search for the project was conducted to identify underwater cultural resources, such as shipwrecks, that could be impacted by construction of discharge pipelines in the bay. The records search was performed using information on file at the State Lands Commission, U.S. Army Corps of Engineers, San Francisco Bay Conservation and Development Commission, and the Port of San Francisco. No shipwrecks or other underwater cultural resources were identified as a result of the records search (SEP2000Dres2, Data Response No. 155).

Previous evaluations of historic structures in the project area were consulted. These include an evaluation of structures on the power plant parcel by Ward Hill and Laurence Shoup (SECAL 2001b, Appendix R2) and an evaluation of structures in the Southern Waterfront survey area that included the adjacent Union Iron Works Pier 70 Historic District by Carey & Co., Inc. (SECAL 2001b Appendix R1).

FIELD SURVEYS

Consultants to the applicant performed an archaeological survey of the Potrero Power Plant property and the underground transmission route. The Area of Potential Effect (APE) for archaeological resources was defined as the power plant parcel. The survey of the power plant was carried out on August 31, 1999 by archaeologist Mark Hale. Parallel transects 20 meters apart were walked by the surveyors where possible. However, the ground surface could not be seen because pavement and structures cover the entire property. Mark Hale performed the archaeological survey of the underground transmission line route on February 28, 2000. Most of the route follows city streets and the entire width of the street right-of-way was surveyed. A small portion of the route south of Islais Creek is not within a street right-of-way. Here a corridor 50 feet wide was surveyed. The area surveyed encompassed the entire underground transmission line route APE (SECAL 2001b, [8.3]:19-20).

Consultants to the applicant also performed an historic architectural resources survey. The APE for the historic architecture survey consisted of the power plant parcel plus all properties directly adjacent to the power plant parcel. Michael Corbett, architectural historian, and Denise Bradley, landscape historian performed the historic architecture survey on January 3, 2001 (SECAL 2001b, [8.3]:20). Denise Bradley performed additional survey of the Pier 70 area on January 27, 2001 (SECAL 2001b, [8.3]:20). Michael Corbett and Denise Bradley performed a windshield survey of the underground transmission route on January 23, 2001 to provide a characterization of the types and ages of the structures along the route (SECAL 2001b, [Appendix R]:R-10).

POWER PLANT PROPERTY

The power plant property is completely developed and is covered by structures and pavement. Some of the property consists of fill placed to reclaim land from San Francisco Bay. Other areas have fill placed to raise the original land surface to create a level area for building. In one such area, the remnants of a powder magazine built in the late 1850s were discovered in an exploratory trench (Wirth Associates 1979). No archaeological resources were identified as a result of the applicant's archaeological surface survey, a predictable result, given the inability to see the original ground surface (SECAL 2001b, [8.3]:19).

Because of the potential for encountering submerged buried cultural resources in the bay, the geotechnical boring and the sediment sampling along the proposed alignments for the water discharge structures was monitored by the applicant's archaeological consultant. Eucalyptus fragments found in geotechnical Boring B-7 at a depth of 9 to 23 feet suggest the presence of a wood pile at this location. Small

wood fragments were found in 8 of the 31 sediment samples. No other historical material was recovered. The eucalyptus wood pile and small wood fragments are interpreted as representing remnants of the East Wharf/Sugar Dock associated with the Western Sugar Refinery. The wharf was the only structure built in the water in the project area and was demolished sometime between 1950 and 1975. The eucalyptus wood pile may have supported the wharf. The small wood fragments probably represent remnants of the wharf material deposited on the bay floor after demolition (SEP2000Dres2, Data Response No. 155). It is not likely that historical material dating to prior to the twentieth century exists on the bay floor in the project area. This area was probably dredged in order to accommodate large ships carrying sugar that moored at the East Wharf. Vessels over 400 feet in length are shown moored at the East Wharf of the Western Sugar Refinery in photos dating to the 1930s and 1940s (SEP2000Dres2, Data Response No. 155).

Three groups of structures constructed more than 45 years ago are within the APE for historic architectural resources. These consist of structures on the power plant property associated with the Station A power plant and the Potrero gas plant, structures on the adjacent parcel to the north that are part of the Union Iron Works Pier 70 Historic District, and structures on the parcel to the south that were part of the Western Sugar Refinery (SECAL 2001b, [8.3]:2).

There are five structures on the power plant property over 45 years old. Three of the structures were part of the Station A power plant and consist of the large Station A building, the Pump House, and the Gate House. The Station A building is a large unreinforced brick masonry structure 435 feet long and 65 feet tall with Classical architectural details on the exterior. There is a large four-story concrete and steel frame 1930 addition on the west side. As a result of the demolition of the boiler room in 1983, only about 50 percent of the original Station A building remains. The remaining part of the Station A structure housed the turbines which generated electricity. No turbines or other equipment remain inside the building. The Pump House and Gate House are east of the Station A building along 23rd Street. The Gate House is also a brick masonry building, while the Pump House is a steel frame structure covered with asbestos panels (SECAL 2001b Appendix R1).

The other two structures of historic age on the power plant property are the Compressor House and the Meter House. These are single story brick masonry buildings that were associated with the gas plant. The rest of the gas plant structures and facilities have been demolished. The meter house has a steel frame covered with foot thick brick walls. A brick dentil course wraps around the building at the eaves. The building rests on a concrete foundation and steel rafters and sleepers support the roof. The building is rectangular, and has nine bays along the long axis and three bays along the short axis. Each bay has a segmented arched window with granite sills. No equipment remains in the building. "Although there is a minimum of applied ornament on this building, it has the general proportions and character of a classical temple with its gabled ends and pilastered walls" (Mirant2001DRes4, Data Response No. 191).

The L-shaped Compressor House is a steel frame structure with a complex system of trusses. It has one-foot thick brick walls and concrete floor and roof. Exterior

decoration consists of rusticated pilasters, framed doorways, and cornice bands. The east-west wing is nine bays long and the north-south wing is six bays long. Columns that support a Pratt truss define the sides of each bay. Other than a control panel and booth, no equipment remains in the building. "The design of the exterior refers to Renaissance and Baroque architecture" (SEP2001Dres4, Data Response No. 191).

The Meter House and the Compressor House were part of the distribution process for manufactured gas. The structures used in manufacturing gas have all been demolished. Gas was manufactured at the Potrero gas plant using coal from 1872 to 1906 and using oil and lamp black thereafter. Gas was extracted from coal by heating coal to more than 600 degrees Celsius in clay retorts. The expelled gas was collected in a pipe at the top of the retort. The gas was forced through water, which helped remove impurities such as tar and ammonia. The gas was further purified in an iron tank with shelves lined with slaked lime that absorbed ammonia, sulfur, and carbonic acid gases. The gas was stored in a holder or reservoir consisting of an enormous sheet iron tub placed upside down in a water-filled brick cistern. The gas was forced through the water and into the tub. The gas pressure forced the tub to rise and the heavy tub maintained the gas under pressure. A 1914 Sanborn fire insurance map shows the following structures (no longer extant) at the gas plant north of Humboldt Street after its conversion to oil and lamp black in 1906: wharves, pumphouses, an oil tank, 2 generator houses (one where oil was heated and one where lamp black was heated), a lamp black storage shed, scrubbers, brick purifier houses, purifier tanks, and several large holders, including one with a capacity of five million cubic feet (Mirant2001DRes4, Data Response No. 190).

South of Humboldt Street was the Meter House, another purifier, and two holders. In 1924 the Compressor House replaced the purifier and one of the holders. Only the Meter House, Compressor House, and the base of one of the holders remain today. The Meter House measured the amount of gas produced before it was distributed. It contained five large machines (no longer present). The Compressor House increased the gas pressure so the gas could be distributed. Much higher pressures were required in San Francisco, compared to other cities, because of the hills and distances to outlying areas, such as Richmond (Mirant2001DRes4, Data Response No. 190).

Some of the structures in the Union Iron Works Pier 70 Historic District are on the parcel adjacent to the north of the power plant. These structures are also known as the San Francisco Yard and consist of 23 industrial buildings/facilities used in shipbuilding. Structures include machine shops, powerhouses, warehouses, and offices built between 1896 and 1941. Piers, slips, and dry docks extend into San Francisco Bay. The earliest buildings are of brick masonry construction. Later buildings were constructed of concrete and metal. Metal buildings, many with gable roofs and monitors, are the most numerous.

There are three warehouses on the parcel south of the power plant at 435 23rd Street. The warehouses were associated with the Western Sugar Refinery. Two of the warehouses are of historic age, built in 1923 and 1929. Both warehouses are of steel frame construction erected on a reinforced concrete foundation. Reinforced

concrete walls enclose the steel frame. There are steel industrial windows and ground level doors. The 1929 warehouse has two levels. The 1923 warehouse has a façade with simple pilasters and cornices. The 1929 warehouse has a façade with pilasters that terminate in Gothic buttress-like features at the top of the walls (Mirant2001DRes4, Data Response No. 188). The sugar refining plant and all other associated structures, except for the three warehouses, were demolished after the plant closed in 1948. Just prior to demolition of most of the structures in 1950, the sugar refinery complex consisted of sixteen structures, as well as water tanks, a fuel tank, wharves, rail spurs and roadways. Structures included several pre-1914 multi-story brick structures and seven one-story wooden warehouses, along with the later concrete and steel warehouses (Mirant2001DRes4, Data Response No. 189). The concrete and steel warehouses built in the 1920s were designed to improve storage conditions for sugar, which is difficult to keep clean and dry.

UNDERGROUND TRANSMISSION LINE

No archaeological resources were identified as a result of the applicant's archaeological surface survey of the underground transmission line route, a predictable result, given the inability to see the original ground surface.

Warehouses and industrial yards flank the route along Illinois Avenue from the power plant to Islais Creek. All except one of the warehouses post-date 1956. There is a rail spur line in the street. There is a grain elevator complex on the east side of Illinois Avenue south of Islais Creek. Portions of the complex were built in 1949, 1953, and 1969. It has been evaluated as ineligible for the NRHP, but potentially significant in a local survey (NRHP status code "5B3") (SECAL 2001b Appendix R1). A firehouse built in 1927 is located on the west side of Illinois Avenue. It has been evaluated as ineligible for an individual listing on the NRHP (SECAL 2001b Appendix R1). Post-1956 warehouses, post office facilities, industrial parks, a tank farm flank the rest of the route along Cargo Way, Jennings Street, and Evans Street, and the Hunters Point Power Plant originally built in 1913. The Hunters Point Power Plant has been evaluated as ineligible for the NRHP, but potentially significant in a local survey (NRHP status code "5B3") (SECAL 2001b Appendix R1).

Historical research indicates that "Butchertown," a slaughterhouse area in the late nineteenth century, was located south of Cargo Way along the underground transmission route. The landward end of the Western Pacific Railroad wharf was located at the intersection of Illinois Avenue and 25th Street.

NATIVE AMERICAN CONTACTS

The consultant to the applicant contacted the Native American Heritage Commission (NAHC) to obtain a list of concerned Native Americans living in the San Francisco area. The applicant sent letters to the Native Americans describing the project and asked about concerns. No responses were received.

CATEGORIZATION OF IDENTIFIED CULTURAL RESOURCES

Various laws apply to the treatment of cultural resources. These laws require the Energy Commission to categorize resources by determining whether they meet

several sets of specified criteria. These categories then in turn influence the analysis of potential impacts to the resources and the mitigation that may be required to ameliorate any such impacts.

Under federal law, only historical or prehistoric sites, objects, or features, or architectural resources that are assessed by a qualified researcher as “important” or “significant” in accordance with federal guidelines need to be considered regarding potential impacts. The significance of historical and prehistoric cultural resources is judged in accordance with the criteria for eligibility for nomination to the National Register of Historic Places (NRHP) as defined in 36 CFR 60.4. If such resources are determined to be significant, and therefore eligible for listing in the National Register, as well as the California Register, they are afforded certain protection under the National Historic Preservation Act and/or CEQA.

The National Register criteria state that “eligible historic properties” are: districts, sites, building, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that (a) are associated with events that have made a significant contribution to the broad patterns of our history; or (b) that are associated with the lives of persons significant in our past; or (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or (d) that have yielded, or may be likely to yield, information important to history or prehistory. Isolated finds by definition do not meet these criteria. California has adopted a very similar set of criteria for assessing resources of statewide importance.

Under federal law, resources determined not to be significant, that is, not eligible for National Register listing, are subject to recording and documentation only, and are afforded no further protection. However, occasionally certain resources, although they may not be assessed as “significant,” may nonetheless be of local or regional importance such that mitigation may be warranted regardless of their assessed significance. Staff evaluates the survey reports and site records for any known resources located within or adjacent to the project APE to determine whether they meet the eligibility criteria.

The record and literature search and the walking surveys of the proposed project APE were conducted to identify the presence of any cultural resource sites or materials. Where resources were identified, additional evaluation was conducted to determine whether the resources are already listed on, or are potentially eligible for listing on, either the National Register of Historic Places (National Register) [36 CFR 800] or the California Register of Historic Resources. The determination of eligibility is made in compliance with the applicable provisions of the National Historic Preservation Act.

CEQA Guidelines now explicitly require the lead agency (in this case, the Energy Commission) to make a determination of whether a proposed project will affect “historical resources.” The guidelines provide a definition for historical resources and set forth a listing of criteria for making this determination. These criteria are the eligibility criteria for the California Register of Historical Resources (CRHR) and are

essentially the same as the eligibility criteria for the NRHP. In addition, as with the NRHP, historical resources must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. Resources eligible for the CRHR may have less integrity than the resources eligible for the NRHP. If the criteria are met and the resource is determined eligible for the CRHR, the Energy Commission must evaluate whether the project will cause a “substantial adverse change in the significance of the historical resource,” which the regulation defines as a significant effect on the environment.

CEQA also contains a section addressing “unique” archeological resources and provides a definition of such resources (Public Resources Code, Section 21083.2). This section establishes limitations on analysis and prohibits imposition of mitigation measures for impacts to archeological resources that are not unique. However, the CEQA Guidelines state that the limitations in this section do not apply when an archeological resource has already met the definition of a historical resource (Title 14, California Code of Regulations, Section 15064.5). Since staff has determined that the sites for which it is recommending mitigation meet the definition of historical resources, the prohibition does not apply to the mitigation discussed in this staff assessment.

Using the above criteria, the applicant has recommended that the Compressor House and Meter House described in the AFC and in subsequent filings for the Potrero project meet the criteria for being an historical resource. In addition, they recommended that the two sugar warehouses and the Union Iron Works Pier 70 Historic District on adjacent properties, but within the project APE, have been evaluated as eligible for the NRHP and therefore also qualify as historical resources according to CEQA.

The Compressor House and Meter House are evaluated as eligible for the CRHR under Criterion A (associated with events that have made a significant contribution to the broad patterns of our history) because they are the only remaining representatives of the facilities used in the gas manufacturing process in San Francisco (SECAL 2001b Appendix R2, page 10). Manufactured gas was critical to the region’s development before 1930. In addition to being eligible under Criterion A, both buildings retain integrity of location, design, setting, materials, workmanship, feeling, and association when considered as individual buildings. However, when considered as part of the gas manufacturing process, the buildings have lost integrity of design (because almost all gas processing equipment has been removed), some integrity of setting (because the other gas plant buildings have been demolished), materials (because the equipment has been removed), workmanship, (because the equipment has been removed), and feeling (because the equipment has been removed). The buildings retain integrity of location and association when considered as part of the gas manufacturing process. Although integrity is, for the most part, lacking in the context of the entire gas plant operation, the two buildings retain sufficient integrity as individual buildings and as representatives of the gas distribution portion of the gas plant operation to be eligible for the CRHR. Commission staff has reviewed the recommendations and has determined that the Compressor House and the Meter House are eligible for the California Register of Historical Resources.

The Union Iron Works Pier 70 Historic District consists of 23 buildings and structures associated with early industry and shipbuilding in San Francisco. These structures are located within the project APE for historic architecture and are on the parcel directly north of the Potrero Power Plant. The Pier 70 structures constitute an historic district that has been evaluated as eligible for the NRHP under Criteria A, B, and C (SECAL 2001b Appendix R1). The results of this evaluation have not been formally submitted to the Historic Resources Commission for a determination of eligibility for the CRHR or to the SHPO for a determination of eligibility for the NRHP. However, the City treats the district as if it is eligible and it is referred to locally as the Pier 70 Historic District. The Port of San Francisco is updating the evaluation with the intention of listing the district on the NRHP (SECAL 2001b, [8.3]:23).

The two sugar warehouses south of the Potrero Power Plant date to 1923 and 1929. They are the only remaining structures from the Western Sugar Refinery begun by the Spreckels family in 1881. The concrete and steel warehouses represented a great improvement over the earlier wood warehouses in providing a clean dry environment for sugar storage. These two warehouses have been evaluated as eligible for both the NRHP and the CRHR under Criterion A because of their association with the Western Sugar Refinery (1881-1948) and the development of the sugar industry in San Francisco (SECAL 2001b Appendix R3). The sugar industry was important in the early development of San Francisco and represents the importance of San Francisco's economic relationship with Hawaii. While other sugar companies had their administrative headquarters in San Francisco, the Western Sugar Company was the only one with a refinery in San Francisco.

The two warehouses retain integrity of location, design, materials, and workmanship. Only minor changes (including replacement of the steel sash windows with aluminum sash windows, walling up of a few of the windows and removal of an awning) have been made to the two structures. Because the other structures and buildings that were part of the sugar refinery have been demolished, there has been some loss of integrity of setting and feeling.

The applicant found that Station A did not retain sufficient integrity to be eligible for the CRHR. Over 50 percent of the major building has been demolished and all of the equipment has been removed. Staff agrees that Station A and the associated buildings are not eligible for the CRHR as a district or as individual buildings. The resource will no longer be considered in this analysis.

The eucalyptus wood pile identified in the underwater inventory was found to be less than 50 years of age. The resource would not qualify for exceptional significance, so staff concludes that this resource does not meet the eligibility criteria for the CRHR. The resource will no longer be considered in this analysis.

The buried cultural resources identified in prior studies and in the historic research for this project are currently inaccessible and their eligibility for the CRHR can not

be determined until after permitting of the project. These resources will continue to be considered in this analysis.

IMPACTS

Since project development and construction usually entail surface and subsurface disturbance of the ground, the proposed Potrero project has the potential to adversely affect both known and previously unknown cultural resources. Direct impacts are those which may result from the immediate disturbance of resources, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, excavation or demolition. Indirect impacts are those which may result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource materials due to improved accessibility. Cumulative impacts to cultural resources may occur if increasing amounts of land are cleared and disturbed for the development of multiple projects in the same vicinity as the proposed project.

The potential for the project to cause impacts to cultural resources is related to the likelihood that such resources are present and whether they are actually encountered during project development and construction activities. Although the existence of known cultural resources increases the potential for additional resources, the absence of known resources does not necessarily mean that unknown resources will not be encountered and that impacts will therefore not occur. In addition, the potential for discovery does not measure the significance of individual artifacts or other cultural resources present, since it is impossible to accurately predict what specific materials could be encountered. Furthermore, sometimes the full significance of discovered cultural resources can only be determined after they have been collected, prepared, and studied by professional archaeologists, historians and/or architectural historians.

POTENTIAL FOR PROJECT IMPACTS

Because project-related site development and construction would entail subsurface disturbance of the ground, the proposed project has the potential to adversely affect previously unknown cultural resources. Although no archaeological sites have been recorded within one quarter mile of the proposed project, historical research indicates the potential for encountering buried features and artifacts from the historic period during the construction of the new power plant facilities and during trenching for the underground transmission line. In addition, historic-era buildings are present on the power plant parcel and on adjacent parcels. Thus, there is a potential for impacts to both subsurface and aboveground historical resources. Although there is no specific indication of prehistoric archaeological sites in the APE, the entire shoreline of San Francisco Bay was heavily used by prehistoric Native American populations.

POWER PLANT PROPERTY

Construction of Unit 7 will disturb about 6.5 acres of the existing 20 acre Potrero Power Plant property. The area where Unit 7 will be constructed is west of Unit 3 and south of the existing storage tanks (see SECAL 2000a, Figure 2-2). The five

buildings of historic age, Station A, the Gate House, the Pump House, the Compressor House, and the Meter House, will be demolished as part of the project (see SECAL 2001b, New Figure 2-10C). All must be demolished or reinforced to comply with the San Francisco Unreinforced Masonry Building Ordinance. The buildings will be demolished because they cannot be retrofitted for power plant use and they cannot be avoided. The small size of the existing property and the location of existing facilities constrain the location of the power plant facilities and structures to be built as part of the proposed project (Mirant2001DResCBE, Data Response No. 80). Even if the proposed project were redesigned to use only one turbine instead of two, the project footprint would only be reduced by about 10 to 15 percent, a reduction insufficient to allow preservation of the Compressor House and Meter House (Mirant2001DResCBE, Data Response No. 83).

Demolition of the Compressor House and Meter House will materially impair the significance of the historical resource and results in a “substantial adverse change in the significance of an historical resource”. Therefore, the project will have a significant effect on the environment (CEQA Guidelines 15064.5(b)). Although mitigation measures, consisting of documentation using large format photography and a historical narrative, are proposed elsewhere in this section, such documentation, “in some circumstances,...will not mitigate the effects” of demolition “to a point where clearly no significant effect on the environment would occur” (CEQA Guidelines 15126.4(b)(2)). Thus, even with mitigation, the demolition of the Compressor House and Meter House will constitute a significant effect on the environment.

The construction of Unit 7 at the Potrero Power Plant will not require any demolition or alteration of the buildings that are included in the Pier 70 District. However, the new power plant and the demolition of the Station A and gas plant buildings could affect the integrity of setting, feeling, and association of the Pier 70 District. The structures to be demolished on the power plant property are from the period of significance of the Pier 70 District (1880-1945). The demolition of the Station A and the gas plant buildings will alter the setting, feeling and association of the Pier 70 District. There will no longer be buildings on the south side of the Pier 70 District that are consistent with the period of significance. The new facility, although industrial in nature as are the current buildings, will be of a very different character than the existing structures. However, because the historic district is large (50 acres) and contains 23 structures, the alteration of the setting, feeling and association will be a minor alteration. The integrity of setting, feeling and association were not defined as important aspects in the eligibility of the resource. Consequently, the change in setting, feeling and association will not materially impair the eligibility of the Pier 70 District. Consequently, this does not represent a significant effect on the environment.

The demolition of the Station A Power Plant structures (turbine room, pump house, and gate house) and the gas plant structures (Meter House and Compressor House), along with construction of the new Unit 7 power plant structures, would affect the setting and feeling of the sugar warehouses. However, these aspects of integrity are not important characteristics for the eligibility of the resources. Construction of the new power plant will not diminish the integrity of setting and

feeling of the two sugar warehouses to the point that it would affect their eligibility for the CRHR and does not materially impair the resources. Consequently, this does not represent a significant effect on the environment.

After demolition, construction of new Unit 7 facilities will require excavation for the foundations of the powerblock, the cooling water intake structure, and the cooling water discharge conduit (see SECAL 2001b, New Figure 2-10A). Offshore, dredging will be required for placement of the discharge extensions with diffusers. Existing disturbed areas within the power plant property will be used for construction laydown and construction parking. They will require minimal grading and placement of gravel.

There is the potential for historic period features and artifacts associated with the mid-nineteenth century powder magazines to be encountered during the excavations to be carried out as part of the project. In addition to the portion of a powder magazine encountered in a test trench by Wirth and Associates (1979), a "dwelling" associated with the magazines is mentioned in historic sources. It is possible that domestic refuse deposits associated with this dwelling could be encountered. If the resources are eligible for the CRHR, the impact from the project will materially impair the resources.

UNDERGROUND TRANSMISSION LINE

The underground transmission line will be installed by means of direct burial along a route within city streets from the Potrero Power Plant to the Hunters Point Switchyard over a distance of 9,400 feet. A six foot by six foot trench will be excavated and 8 inch diameter PVC pipe will be buried in the bottom of the trench. Conduit will be installed under Islais Creek by directional boring. Splice boxes, approximately 10 feet long by 10 feet wide by 8 feet high, will be installed along the underground transmission line about every 3000 feet to 6000 feet. Staging areas for the horizontal drilling will also be required on each side of Islais Creek. On the north side of the creek an area about 50 feet by 50 feet and on the south side of the creek an area about 25 feet by 25 feet will be excavated several feet below grade.

Trenching for the underground transmission line could impact buried historical material associated with "Butchertown" south of Cargo Way. Such material could consist of animal bone, butchers' tools, building materials, and domestic refuse. Trenching for the underground transmission line along Illinois Avenue where it crosses 25th Street could impact buried portions of the Western Pacific Railroad wharf. If the resources are eligible for the CRHR, the impact from the project will materially impair the resources.

CUMULATIVE IMPACTS

Cumulative impacts to cultural resources in the project vicinity may occur if increasing numbers of structures of historic age are demolished and if subsurface archaeological deposits (both prehistoric and historic) are affected by other projects in the same vicinity as the proposed project. However, the largest group of industrial historical buildings remaining in the area is the Pier 70 Historical District, adjacent to the proposed project on the north. The City and Port of San Francisco

are studying adaptive reuse of these structures as part of future development projects. Thus, these structures will likely be preserved as a result of future projects, rather than impacted. The other group of historic buildings in the area is the residential, commercial, and industrial buildings in the Dogpatch Neighborhood west of Third Street. No specific projects proposed for this area are known, although changes are likely.

Impacts to subsurface archaeological resources from the proposed project and other projects in the vicinity could occur. However, project proponents for this and future projects in the area can mitigate impacts to as yet undiscovered subsurface archaeological sites to less than significant by implementing mitigation measures requiring construction monitoring, evaluation of resources discovered during monitoring, and avoidance or data recovery for resources evaluated as significant (eligible for the CRHR or NRHP).

IMPACTS OF FACILITY CLOSURE

The anticipated lifetime of the Potrero Power Plant Unit 7 Project is expected to be approximately forty years. It is anticipated that upgrades or modifications made prior to the facility's closure might extend the life of the plant. Closure would be caused by either (1) a natural or manmade disaster or economic difficulty, or (2) planned orderly closure that will occur when the plant becomes economically non-competitive.

PLANNED CLOSURE

At the time of planned closure, all then-applicable LORS will be identified and the Energy Commission-required closure plan will address compliance with these LORS. Generally, if no additional ground disturbance occurs during closure activities and all conditions of certification have been met, no impacts to cultural resources would be expected. However, actual potential impacts are likely to depend upon the final location of project structures in relation to existing resources, and upon the procedures used for the removal of project structures. Since the spatial relationship between the closure and removal of project structures and sensitive resources cannot be determined at this time, no conclusion can be drawn at this time with respect to the impact of facility closure on cultural resources.

TEMPORARY CLOSURE

A contingency plan for temporary cessation of operation would be implemented that would ensure compliance with all applicable LORS.

UNEXPECTED PERMANENT CLOSURE

If a site were abandoned, impact to cultural resources would be unlikely because there would be no immediate soil disturbances. Over time, depending on the need to disturb the ground to accomplish project closure and facility removal, some disturbance of known and/or previously unknown cultural resources might result.

COMPLIANCE WITH APPLICABLE LORS

The City of San Francisco has no specific LORS that apply to cultural resources apart from compliance with CEQA.

MITIGATION

For cultural resources, the preferred method of mitigation is for project construction to avoid areas where cultural resources are known to exist, wherever possible. Often, however, avoidance cannot be achieved, and other measures such as surface collection, subsurface testing, and data recovery must be implemented for archaeological resources and documentation must be implemented for historical structures. Mitigation measures are developed to attempt to reduce the potential for adverse project impacts on cultural resources to a less than significant level.

Adaptive use of buildings or the moving of buildings with rehabilitation in accordance with the Secretary of Interior's Standard would be a type of mitigation that would reduce the impact of the proposed project to less than significant. Demolition of buildings even with recordation will not reduce the impact of the proposed project to less than significant.

APPLICANT'S PROPOSED MITIGATION

ARCHAEOLOGICAL RESOURCES

As recommended by the consultant to the applicant in the cultural resources Station A Amendment to the AFC, a subsurface testing program should be implemented to identify buried archaeological resources prior to construction (SECAL 2001b, [8.3]:26). They recommend boring within the areas of ground disturbance for the power plant construction, as well as along the route of the underground transmission cable. If archaeological resources are identified as a result of the boring, they would be evaluated for significance (CRHR eligibility). If a resource is evaluated as significant and avoidance is not feasible, the applicant recommends preparation of a data recovery plan that specifies what scientifically consequential information can be provided by the resource and how such information will be recovered. The data recovery plan would then be implemented.

The applicant also states that construction monitoring by a qualified archaeologist may be necessary, depending on the results of the test program. If archaeological material is observed by the monitoring archaeologist, ground disturbing activity would be halted in the vicinity of the find so that its significance (CRHR eligibility) can be determined. If evaluated as significant, mitigation measures (avoidance or data recovery) would be developed in consultation with the CEC.

The applicant recommends a worker education program to ensure that buried archaeological resources are recognized by construction crews. Such a program would include information about the kinds of archaeological material that could be encountered and the procedures to be followed if such material is discovered.

HISTORIC ARCHITECTURAL RESOURCES

The applicant recommends documentation of the Compressor House and the Meter House using Historic American Engineering Record (HAER) standards. These standards include large format photography of the structures, photo reproduction of historic plans and photos of the structures, and a descriptive and historical narrative. The applicant recommends that the resulting documentation be archived in a local repository, such as the San Francisco Main Library or the California Historical Society.

CCSF PROPOSED MITIGATION

Demolition of the significant structures on the power plant site would affect the setting of adjacent significant historic resources, the 1923 Western Refining Sugar Warehouse and the Pier 70 historic district both of which are eligible for the National Register of Historic Places. Consequently, the following mitigation is recommended:

Adaptive use of the extant power plant facilities should be the first priority. If historic resources on the power plant site are compromised by the expansion project Mirant should mitigate this impact by providing financial resources to identify and protect neighboring historic structures in the Pier 70 area, as this area shares the same historical context and significance as the power plant site. If adaptive use is not feasible, the resources on the power plant site should be recorded in accordance with Historic American Engineering Record standards as developed by the US Department of the Interior and the Library of Congress prior to demolition. This could include, but is not limited to, a building inventory, written architectural descriptions, and accurate architectural and engineering drawings.

STAFF'S PROPOSED MITIGATION MEASURES

Commission staff concurs with the mitigation measures proposed by the applicant in the amended AFC. In addition, information about the history of these buildings should be provided to the public, both through documents for the general public need to be developed and distributed to local libraries and schools and through an on-site interpretive kiosk. Staff has adapted the applicant's proposed mitigation measures into a series of conditions of certification, sometimes rewording for clarification and adding time frames and other requirements.

Staff agrees that adaptive use or moving the buildings is a preferable mitigation over the demolition. Rehabilitation of the CRHR eligible buildings at an off site location would reduce the impacts of the project to less than significant. The mitigation measures provided by the CCSF are incorporated to some degree in the conditions. However, a connection between the funding of preservation for adjacent buildings that are not of the same historical significance as those affected by the project is not clear. A condition to provide funding may be included in the Final Staff Assessment as an additional mitigation measure. Additional mitigation measures are being considered that may reduce the impacts of the project to less than significant.

The proposed mitigation measures would apply to any potential for impacts to sensitive cultural resources in all areas affected by the project. Mitigation measures are derived from good professional practice and they are based on the U.S. Secretary of the Interior's guidelines. The mitigation measures set forth in the conditions have been applied to previous projects before the Commission and they have proven successful in protecting sensitive cultural resources from construction-related impacts while allowing the timely completion of many projects throughout California.

Staff recommends preparation of a research design and testing plan prior to subsurface testing and construction. The plan would provide research questions relevant to the kinds of buried archaeological resources that could be encountered and would provide guidelines for making decisions about CRHR eligibility. This plan would expedite the evaluation process, especially for resources encountered during construction.

Staff also recommends construction monitoring for both the power plant and underground transmission cable. Adoption of staff's proposed conditions of certification is expected to reduce the potential for adverse project impacts on cultural resources but may not reduce the impact to less than a significant level. Mitigation measures are still being considered that might reduce the impact to less than significant. The Final Staff Assessment will discuss all mitigation measures as well as whether the mitigation measures will result in a reduction of the impact to less than significant level.

CONCLUSIONS AND RECOMMENDATION

CONCLUSIONS

The results of previous testing on the power plant property indicate that buried archaeological resources from the historic period could be encountered during construction. In addition, there are two historical structures on the power plant property (the Meter House and the Compressor House) that have been evaluated as eligible for the CRHR, but that will be demolished to comply with the City's Unreinforced Masonry Building Ordinance and to make way for the new Unit 7 facilities. If the following conditions of certification are properly implemented, the project will comply with applicable laws, ordinances, regulations, and standards. Additional information and research will be conducted to evaluate appropriate conditions of certification.

RECOMMENDATION

Staff recommends that the Commission adopt the following proposed conditions of certification, which incorporate the mitigation measures discussed above.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of any ground disturbance, the project owner shall provide the California Energy Commission (Commission) Compliance Project Manager (CPM) with the name and statement of qualifications of its Cultural Resource Specialist (CRS), who will be responsible for implementation of all cultural resources Conditions of Certification. An alternate CRS may be also be proposed to carry out the duties of the CRS if that person is unable to fulfill those duties for some reason. The alternate CRS must also meet the requirements below

Protocol: The statement of qualifications for the CRS shall include all information needed to demonstrate that the CRS meet the minimum qualifications set forth below, including the following:

- a) a graduate degree in anthropology, archaeology, California history, cultural resource management, or a comparable field;
- b) at least three years of archaeological resource mitigation and field experience in California; and
- c) at least one year's experience in each of the following areas:
 - 1. leading archaeological resource field surveys;
 - 2. leading site and artifact mapping, recording, and recovery operations;
 - 3. marshalling and use of equipment necessary for cultural resource recovery and testing;
 - 4. preparing recovered materials for analysis and identification;
 - 5. determining the need for appropriate sampling and/or testing in the field and in the lab;
 - 6. directing the analyses of mapped and recovered artifacts;
 - 7. completing the identification and inventory of recovered cultural resource materials; and
 - 8. preparing appropriate reports to be filed with the receiving curation repository, the State Historic Preservation Officer (SHPO), and the appropriate regional archaeological information center(s).

The statement of qualifications for the CRS shall include:

- a) a list of specific projects the CRS has previously worked on;
- b) the role and responsibilities of the CRS for each project listed; and
- c) The names and phone numbers of contacts familiar with the CRS's work on these referenced projects.

Verification: At least 90 days prior to the start of project earth disturbing activities, the project owner shall submit the name and statement of qualifications of its CRS, and alternate if desired, to the CPM for review and approval.

At least 10 days, but no more than 30 days prior to the start of any ground disturbance or cultural resources recordation, the project owner shall confirm in writing to the CPM that the approved CRS will be available at the start date and is prepared to implement the cultural resource Conditions of Certification.

At least 10 days prior to the termination or release of a CRS, the project owner shall obtain CPM approval of the replacement CRS by submitting to the CPM the name and a statement of qualifications of the proposed new CRS.

Cul-2 Prior to the start of any ground disturbing activities, or demolition, the project owner shall provide the California Energy Commission (Commission) Compliance Project Manager (CPM) with the name and statement of qualifications of an architectural historian who will prepare Historic American Engineering Record (HAER) level documentation of the Meter House and Compressor House.

Protocol: The statement of qualifications for the architectural historian shall include all information needed to demonstrate that the architectural historian, including:

- a) meets the Secretary of Interior's Professional Qualifications for architectural history;
- b) has at least 5 years experience in recording 19th century architectural buildings;
- c) names and phone numbers of contacts familiar with the architectural historian's work on these referenced projects.

Verification: At least 90 days prior to the start of project earth disturbing activities, the project owner shall submit the name and statement of qualifications of its architectural historian to the CPM for review and approval.

Cul-3 Prior to demolition or alteration of the Meter House or the Compressor House, the architectural historian will prepare Historic American Engineering Record (HAER) level documentation of the Meter House and Compressor House. This will include large format photography (views of overall site, individual buildings, and building details), a descriptive and historical narrative, and a historic context for the pre-1930 gas manufacturing process.

Verification: At least 30 days prior to demolition or alteration of the Meter House or the Compressor House, a copy of the HAER recording of the Meter House and Compressor House will be provided to the CPM for review and approval.

Within 30 days after CPM approval, the project owner will provide a copy of the transmittal letters to the CPM of the HAER documentation to the San Francisco Public Library and the California Historical Society.

Cul-4 Prior to the start of any ground disturbance, the project owner shall provide the CRS and the CPM with maps and drawings showing the footprint of the power plant and all linear facilities. Maps provided will include the USGS 7.5 minute topographic quadrangle map and a map at an appropriate scale (e.g., 1:2000 or 1" = 200') for plotting individual artifacts. If the designated cultural resource specialist requests enlargements or strip maps for linear facility routes, the project owner shall provide them. In addition, the project owner shall provide a set of these maps to the CPM at the same time that they are provided to the specialist. If the footprint of the power plant or linear facilities changes, the project owner shall provide maps and drawings reflecting these changes, to the CRS and the CPM within five days. Maps shall show the location of all areas where surface disturbance may be associated with project related access roads, and any other project components.

Verification: At least 75 days prior to the start of ground disturbance on the project, the project owner shall provide the CRS and the CPM with the maps and drawings. Copies of maps or drawings reflecting changes to the footprint of the power plant and/or linear facilities shall be submitted to the CRS and the CPM within five days of the changes.

CUL- 5 Prior to the start of ground disturbance; the CRS shall prepare, and the project owner shall submit to the CPM for review and approval, a Cultural Resources Monitoring and Mitigation Plan (CRMMP), identifying general and specific measures to minimize potential impacts to buried cultural resources. Approval of the CRMMP, by the CPM, shall occur prior to any disturbance.

Protocol: The Cultural Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures.

- a. A proposed research design that includes a discussion of questions that may be answered by the mapping, data and artifact recovery conducted during monitoring and mitigation activities, and by the post-construction analysis of recovered data and materials.
- b. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the pre-construction, construction, and post-construction analysis phases of the project.
- c. Identification of the person(s) expected to perform each of the tasks; a description of each team member's qualifications and their responsibilities; and the reporting relationships between project construction management and the mitigation and monitoring team.
- d. A discussion of the inclusion of Native American observers or monitors, the procedures to be used to select them, and their role and responsibilities.
- e. A discussion of any measures such as flagging or fencing, to prohibit or otherwise restrict access to sensitive resource areas that are to be

avoided during construction and/or operation, and identification of areas where these measures are to be implemented. The discussion shall address how these measures will be implemented prior to the start of construction and how long they will be needed to protect the resources from project-related effects.

- f. A discussion of the location(s) where monitoring of project construction activities is deemed necessary by the CRS. The CRS will determine the size or extent of the areas where monitoring is to occur and will establish the percentage of the time that the monitor(s) will be present, however monitoring shall be conducted full time in the specified areas that follow.
- g. A discussion of the requirement that all cultural resources encountered will be recorded and mapped (may include photos) and that all cultural materials recovered as part of a discovery or data recovery will be collected for analysis and eventual curation into a retrievable storage collection in a public repository or museum. The public repository or museum must meet the standards and requirements for the curation of cultural resources set forth at Title 36 of the Federal Code of Regulations, Part 79.
- h. A discussion of the availability and the CRS's access to equipment and supplies necessary for site mapping, photographing, and recovering any cultural resource materials encountered during construction.
- i. Identification of the public institution that has agreed to receive any data and cultural resources recovered during project-related monitoring and mitigation work. Discussion of any requirements, specifications, or funding needed for curation of the materials to be delivered for curation and how they will be met. Also the name and phone number of the contact person at the institution shall be included.

Verification: At least 60 days prior to the start of ground disturbance, the project owner shall provide the Cultural Resources Monitoring and Mitigation Plan, prepared by the CRS, to the CPM for review and approval.

CUL-6 Prior to the start of ground disturbance, the CRS shall prepare an employee training program. The project owner shall submit the cultural resources training program to the CPM for review and approval.

Protocol: The training program shall discuss the potential to encounter cultural resources in the field, the sensitivity and importance of these resources, and the legal obligations (state and/or federal as appropriate) to preserve and protect such resources. Components of the program may include a video or other audio/visual presentation and may be combined with other training programs prepared for biological resources, paleontologic resources, hazardous materials, or any other areas of interest or concern. Required components of the program include: 1) a clearly identifiable decal/sticker to be worn on the hardhats of those workers that have completed the training, 2) a method of verification that those individuals who have received the training acknowledge their responsibilities and the possible penalties if the resource protection measures are not followed, 3) hands-on presentations by the cultural resources specialist or cultural resources monitor demonstrating some of the most common cultural

materials that would be encountered, and 4) a handout that includes information on the above required elements and a set of resource reporting procedures and work curtailment procedures that workers are to follow if previously unknown cultural resources are encountered during project activities and a statement that the CRS has the ability to stop work when cultural resources are discovered.

Verification: At least 60 days prior to the start of ground disturbance; the project owner shall submit to the CPM for review and approval, the proposed employee training program, the set of reporting procedures, and the work curtailment procedures that the workers are to follow if previously unknown cultural resources are encountered during construction. The project owner shall provide the name and resume of the individual(s) performing the training.

CUL-7 Prior to the start of ground disturbance; and throughout the project construction period as needed for all new employees, the project owner shall ensure that the designated cultural resource trainer(s) provide(s) the CPM-approved cultural resources training to all project managers, construction supervisors, and workers. The project owner shall ensure that the designated trainer provides the workers with the CPM-approved set of procedures for reporting any sensitive resources that may be discovered during project-related ground disturbance and the work curtailment procedures that the workers are to follow if previously unknown cultural resources are encountered during construction.

Verification: Within 7 days after the start of ground disturbance, the project owner shall provide the CPM with documentation that the designated cultural resources trainer(s) has/have provided to all project managers, construction supervisors, and workers hired before the start of construction the CPM-approved cultural resource training and the set of reporting and work curtailment procedures.

In each Monthly Compliance Report, after the start of construction, the project owner shall provide the CPM with documentation that the designated cultural resource trainer(s) has/have provided to all project managers, construction supervisors, and workers hired in the month to which the report applies, the CPM-approved cultural resources training and the set of resource reporting and work curtailment procedures.

CUL-8 The CRS or the CRS's delegated monitor(s) shall have the authority to halt or redirect construction if previously unknown cultural resource sites or materials are encountered during project construction related vegetation clearance or earth disturbing activities or project site preparation.

If such resources are found, the CRS shall contact the CPM as soon as possible for a determination of significance.

If such resources are found and the CPM determines that they are or may be significant, the halting or redirection of construction shall remain in effect until:

1. the specialist, the project owner, and the CPM have conferred and determined what, if any, data recovery or other mitigation is needed; and
2. any needed data recovery and mitigation has been completed.

The CRS, the project owner, and the CPM shall confer within five working days of the notification of the CPM to determine what, if any, data recovery or other mitigation is needed.

If data recovery or other mitigation measures are required, the CRS and team members shall monitor construction activities and implement the agreed upon data recovery and mitigation measures, as needed.

All required data recovery and mitigation shall be completed expeditiously unless all parties agree to additional time.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall provide the CPM with a letter confirming that the CRS and/or alternate CRS and delegated monitor(s) have the authority to halt construction activities in the vicinity of a cultural resource find.

CUL-9 Prior to the start of ground disturbance; and each week throughout project construction, the project owner shall provide the CRS with a current schedule of anticipated project activity in the following month and a map indicating the area(s) where the construction activities will occur. The CRS shall consult daily with the project superintendent or construction field manager to confirm the area(s) to be worked on the next day(s).

Verification: At least 10 days prior to the start of ground disturbance, and in each Monthly Compliance Report thereafter, the project owner shall provide the CPM with a copy of each weekly schedule of the construction activities. The project owner shall notify the CPM when all ground disturbing activities, including landscaping, are completed.

CUL-10 Throughout the construction monitoring and mitigation phases of the project, the CRS and delegated monitor(s) shall keep a daily log of any resource finds and the progress or status of the resource monitoring, mitigation, preparation, identification, and analytical work being conducted for the project. The daily logs shall indicate by tenths of a post mile, where and when monitoring has taken place, where monitoring has been deemed unnecessary, and where cultural resources were found.

The CRS shall prepare a weekly summary of the daily logs on the progress or status of cultural resource-related activities.

The CRS and delegated monitor(s) may informally discuss the cultural resource monitoring and mitigation activities with Commission technical staff.

Verification: Throughout the project construction period, the project owner shall ensure that the daily log(s) and the weekly summary reports prepared by the CRS and delegated monitor(s) are available for periodic audit by the CPM.

CUL-11 The project owner shall ensure that the CRS performs the recovery, preparation for analysis, analysis, preparation for curation, and delivery for curation of all cultural resource materials encountered and collected during pre-construction surveys and during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files, copies of signed contracts or agreements with the museum(s), university (ies), or other appropriate research specialists. The project owner shall maintain these files for the life of the project and the files shall be kept available for periodic audit by the CPM. Information as to the specific location of sensitive cultural resource site shall be kept confidential and accessible only to qualified cultural resource specialists.

CUL-12 Following completion of data recovery and site mitigation work, the project owner shall ensure that the CRS prepares a proposed scope of work for the Cultural Resources Report and for a document for the general public. The project owner shall submit the proposed scope of work to the CPM for review and approval.

Protocol: The proposed scope of work shall include (but not be limited to):

- a. a discussion of any analysis to be conducted on recovered cultural resource materials;
- b. discussion of possible results and findings;
- c. proposed research questions which may be answered or raised by analysis of the data recovered from the project;
- d. an estimate of the time needed to complete the analysis of recovered cultural resource materials and to prepare the Cultural Resources Report;
- e. evaluation of historic buildings;
- f. HAER recording of historical buildings; and
- g. a public oriented document for distribution to local libraries and schools.

Verification: The project owner shall ensure that the CRS prepares the proposed scope of work within 90 days following completion of the data recovery and site mitigation work. Within 7 days after completion of the proposed scope of work, the project owner shall submit it to the CPM for review and approval.

CUL-13 The project owner shall ensure that the CRS prepares a Cultural Resources Report (CRR) and a document for the general public. The project owner shall submit the CRR and public report to the CPM for review and approval.

Protocol: The Cultural Resources Report shall include (but not be limited to) the following:

- a. For all projects:
 1. evaluation of historic buildings;
 2. HAER recording of historical buildings; and
 3. a public oriented document for distribution to local libraries and schools.
 4. description of pre-project literature search, surveys, and any testing activities;
 5. maps showing areas surveyed or tested;
 6. a description of any monitoring activities;
 7. maps, including maps using a 7.5 minute USGS topographic base, of any areas monitored; and
 8. conclusions and recommendations.
- b. For projects in which cultural resources were encountered, include the items specified under “a” and also provide:
 1. site and isolate records and maps;
 2. a description of testing for, and determinations of, significance and potential eligibility; and
 3. a discussion of the research questions answered or raised by the data from the project.
- c. For projects regarding which cultural resources were recovered, include the items specified under “a” and “b” and also provide:
 4. a description of the methods employed in the field and laboratory; a description (including drawings and/or photos) of recovered cultural materials;
 5. results and findings of any special analyses conducted on recovered cultural resource materials;
 6. an inventory list of recovered cultural resource materials; an interpretation of the site(s) with regard to the research design; and
 7. the name and location of the public repository receiving the recovered cultural resources for curation.

Verification: The project owner shall ensure that the CRS completes the CRR and the public document within 90 days following completion of the analysis of the recovered cultural materials. Within 7 days after completion of the report, the project owner shall submit the CRR and the public document to the CPM for review and approval.

CUL-14 The project owner shall submit an original, an original-quality copy, and a computer disc copy (or other format to meet the repository's requirements), of the CPM-approved CRR to the public repository to receive the recovered data and materials for curation, with copies to the State Historic Preservation Officer (SHPO), the appropriate regional archaeological information center(s). If the report is submitted to any of these entities on a computer disc, the disc files must meet SHPO requirements for format and content.

Protocol: The copies of the CRR to be sent to the entities specified above shall include the following (based on the applicable scenario (a, b, or c) set forth in condition Cul-12):

- a. originals or original-quality copies of all text;
- b. originals of any topographic maps showing site and resource locations;
- c. originals or original-quality copies of drawings of significant or diagnostic cultural resource materials found during pre-construction surveys or during project monitoring and mitigation and subjected to post-recovery analysis and evaluation.
- d. photographs of any cultural resource site(s) and the various cultural resource materials recovered during project monitoring and mitigation and subjected to post-recovery analysis and evaluation. The project owner shall provide the curation repository with a set of negatives for all of the photographs.

Verification: Within 30 days after receiving approval of the CRR, the project owner shall provide to the CPM documentation that the report has been sent to the public repository receiving the recovered data and materials for curation, the SHPO and the appropriate archaeological information center(s).

For the life of the project the project owner shall maintain in its compliance files copies of all documentation related to the filing of the CPM-approved CRR with the public repository receiving the recovered data and materials for curation.

CUL-15 Following the filing of the CPM-approved CRR with the appropriate entities, specified in condition CUL-14, the project owner shall ensure that all cultural resource materials, maps, and data collected during data recovery and mitigation for the project are delivered to a public repository that meets the US Secretary of Interior requirements for the curation of cultural resources. The project owner shall pay any fees for curation required by the repository.

Verification: The project owner shall ensure that all recovered cultural resource materials are delivered for curation within 30 days after providing the CPM-approved CRR to the entities specified in CUL-14

For the life of the project the project, owner shall maintain in its of compliance files, copies of signed contracts or agreements with the public repository to which the project owner has delivered for curation all cultural resource materials collected during data recovery and mitigation for the project.

CUL-16 The project owner shall submit an original or an original-quality copy of the CPM-approved public document to the local public libraries and public schools.

Verification: Within 30 days after receiving approval of the public document, the project owner shall provide to the CPM documentation that the report has been sent to the local public libraries and public schools.

Cul-17 The project owner shall ensure that an interpretive kiosk that provides a public interpretation of the history of the project area is built along Illinois Street and maintained in good condition throughout the life of the project. The kiosk design, a script and proposed graphics will be provided to the CPM for review and approval.

Verification: Within 90 days after receiving approval of the kiosk design, a script and proposed graphics, the project owner will provide a letter to the CPM describing the contractor that will be constructing the interpretive kiosk and installing the displays. The letter will include the proposed completion date for the display.

REFERENCES

- Mirant (Mirant Corporation). Mirant2001DResCBE. Mirant responses to Communities for a Better Environment, Data Requests, Nos. 1 through 113, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission April, 2001.
- Mirant (Mirant Corporation). Mirant2001DRes4. Southern Energy California response to staff Data Requests, Set 4, Nos. 170 through 194, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission March 27, 2001.
- SECAL (Southern Energy California). 2000a. Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, May 31, 2000.
- SECAL (Southern Energy California). 2001b. Amendment to the Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Addresses data responses to staff's Data Requests 30 – 32 (Cultural Resources), revises AFC Section 8.3, Cultural Resources, and AFC Appendix R, Cultural Resources. Submitted to the California Energy Commission, January 31, 2001.
- SECAL (Southern Energy California). 2001b Appendix R1. Amendment to the Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Appendix R1, Historic Resources Report: Southern Waterfront, San Francisco, California. Submitted to the California Energy Commission, January 31, 2001.
- SECAL (Southern Energy California). 2001b Appendix R2. Amendment to the Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Appendix R2, Draft Historic Architecture Report: Station A Potrero Power Plant in the City and County of San Francisco. Submitted to the California Energy Commission, January 31, 2001.
- SECAL (Southern Energy California). 2001b Appendix R3. Amendment to the Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Appendix R3, Historic Architecture Report: 435 23rd Street, City and County of San Francisco. Submitted to the California Energy Commission, January 31, 2001.
- SECAL (Southern Energy California). SEP2000DRes1. Southern Energy California response to staff Data Requests, Set 1, Nos. 1 through 139, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission, December 7, 2000.

SECAL (Southern Energy California). SEP2000DRes2. Southern Energy California response to staff Data Requests, Set 2, Nos. 140 through 161, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission, December 21, 2000.

URS/Dames & Moore. 2000. Potrero Power Plant Unit 7 Project: Research Design for Limited Subsurface Archaeological Investigations (Confidential). Submitted to Southern Energy Potrero, December 5, 2000.

Wirth Associates Inc. 1979. Potrero 7: Phase II, Archaeological Test Excavations. Prepared for Pacific Gas & Electric Company. Report S-14074 on file at the Northwest Center of the California Historical Resources Information System.

HAZARDOUS MATERIALS MANAGEMENT

Alvin J. Greenberg, Ph.D. and Rick Tyler

INTRODUCTION

The purpose of this Preliminary Staff Analysis (PSA) is to determine if the proposed Potrero Power Plant Unit 7 Project (Unit 7) has the potential to cause significant impact on the public as a result of the use, handling or storage of hazardous materials at the proposed facility. If significant adverse impacts on the public are identified, Energy Commission staff must also evaluate the potential for facility design alternatives and additional mitigation measures to reduce impacts to the extent feasible.

This analysis does not address potential exposure of workers to hazardous materials used at the proposed facility. Employers must inform employees of hazards associated with their work and thus employees accept a higher level of risk than the general public as a condition of employment. Workers are thus not afforded the same level of protection normally provided to the public. Further, workers can be provided with special protective equipment and training to reduce the potential for health impacts associated with the handling of hazardous materials. Staff's **Worker Safety and Fire Protection** analysis also describes the requirements applicable to the protection of workers from such risks.

The only hazardous material stored at the Potrero Power Plant Unit 7 in quantities exceeding the reportable amounts defined in the California Health and Safety Code, section 25532 (j), is aqueous ammonia (29 percent ammonia in aqueous solution; see Tables 8.12-2, 8.12-3 and 8.12-4 of the Application for Certification [SECAL 2000a, AFC]). The use of aqueous ammonia significantly reduces the risk that would otherwise be associated with use of the more economical anhydrous form of ammonia. Use of the aqueous form eliminates the high internal energy associated with the more hazardous anhydrous form, which is stored as a liquefied gas at elevated pressure. The high internal energy associated with the anhydrous form of ammonia can act as a driving force in an accidental release which can rapidly introduce large quantities of the material to the ambient air, where it can be transported in the atmosphere and result in high down-wind concentrations. Spills associated with the aqueous form are much easier to contain and emissions are limited by the slow mass transfer from the surface of the spilled material.

Other hazardous materials stored in smaller quantities, such as mineral and lubricating oils, corrosion inhibitors and water conditioners, will be present at the proposed facility. However, these materials pose no significant potential for off-site impacts as a result of the quantities on-site, their relative toxicity, and/or their environmental mobility. Although no natural gas is stored, the project will also involve the construction and operation of a natural gas pipeline and handling of large amounts of natural gas. Natural gas poses some risk of both fire and explosion, however, the gas line will not be lengthy and will be attached to an existing on-site main. Thus, off-site gas pipeline construction will not be required and the pipeline design is addressed in staff's **Facility Design** analysis.

Unit 7 will also require the transportation of aqueous ammonia to the facility. Analysis of the potential for impact associated with such deliveries is addressed below.

LAWS, ORDINANCES, REGULATIONS, STANDARDS AND POLICIES

The following federal, state, and local laws and policies apply to the protection of public health and hazardous materials management. Staff's analysis examines the project's compliance with these requirements.

FEDERAL

The Superfund Amendments and Reauthorization Act of 1986 (Pub. L. 99-499, §301,100 Stat. 1614 [1986]), also known as SARA Title III, contains the Emergency Planning and Community Right To Know Act (EPCRA) as codified in 42 U.S.C. §11001 et seq. This Act requires that certain information about any release to the air, soil, or water of an extremely hazardous material must be reported to state and local agencies.

The Clean Air Act (CAA) of 1990 (42 U.S.C. §7401 et seq. as amended) established a nationwide emergency planning and response program and imposed reporting requirements for businesses which store, handle, or produce significant quantities of extremely hazardous materials. The CAA section on Risk Management Plans - codified in 42 U.S.C. §112(r) - requires the states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of the CAA are reflected in the California Health and Safety Code, section 25531 et seq.

Currently, due to the high volume of petroleum-containing hazardous materials already in place on this site, the applicant is required to have a Spill Prevention Control and Countermeasure Plan (SPCC) in place (Hazardous Waste Contingency Plan Title 40 C.F.R., Part 112.7).

STATE

The California Accidental Release Prevention Program (Cal-ARP) - Health and Safety Code, section 25531 - directs facility owners storing or handling acutely hazardous materials in reportable quantities, to develop a Risk Management Plan (RMP) and submit it to appropriate local authorities, the United States Environmental Protection Agency (USEPA), and the designated local Administering Agency for review and approval. The plan must include an evaluation of the potential impacts associated with an accidental release, the likelihood of an accidental release occurring, the magnitude of potential human exposure, any preexisting evaluations or studies of the material, the likelihood of the substance being handled in the manner indicated, and the accident history of the material. This new, recently developed program supersedes the California Risk Management and Prevention Plan (RMPP).

Section 25503.5 of the California Health and Safety Code requires facilities which store or use hazardous materials to prepare and file a Business Plan with the local Certified Unified Program Authority (CUPA), in this case the San Francisco County Public Health Department. This Business Plan is required to contain information on the business activity, the owner, a hazardous materials inventory, facility maps, an Emergency Response Contingency Plan, an Employee Training Plan, and other recordkeeping forms.

Title 8, California Code of Regulations, section 5189, requires facility owners to develop and implement effective safety management plans to insure that large quantities of hazardous materials are handled safely. While such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the RMP process.

Title 8, California Code of Regulations, section 458 and sections 500 – 515, set forth requirements for design, construction and operation of vessels and equipment used to store and transfer anhydrous ammonia. These sections generally codify the requirements of several industry codes, including the ASME Pressure Vessel Code, ANSI K61.1 and the National Boiler and Pressure Vessel Inspection Code. While these codes apply to anhydrous ammonia, they may also be used to design storage facilities for aqueous ammonia.

California Health and Safety Code, section 41700, requires that “No person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property.”

GAS PIPELINE

The safety requirements for pipeline construction vary according to the population density and land use, which characterize the surrounding land. The pipeline classes are defined as follows (Title 49, Code of Federal Regulations, Part 192):

- Class 1: Pipelines in locations with ten or fewer buildings intended for human occupancy.
- Class 2: Pipelines in locations with more than ten but fewer than 46 buildings intended for human occupancy. This class also includes drainage ditches of public roads and railroad crossings.
- Class 3: Pipelines in locations with more than 46 buildings intended for human occupancy, or where the pipeline is within 100 yards of any building or small well-defined outside area occupied by 20 or more people on at least 5 days a week for 10 weeks in any 12 month period (The days and weeks need not be consecutive).

The natural gas pipeline will be designed for Class 3 service and will meet California Public Utilities Commission General Order 112-D and 58-A standards as well as various PG&E standards. The natural gas pipeline must be constructed and

operated in accordance with the Federal Department of Transportation (DOT) regulations, Title 49, Code of Federal Regulations (CFR), Parts 190, 191, and 192:

- Title 49, Code of Federal Regulations, Part 190 outlines the pipeline safety program procedures;
- Title 49, Code of Federal Regulations, Part 191, Transportation of Natural and Other Gas by Pipeline; Annual Reports, Incident Reports, and Safety-Related Condition Reports, requires operators of pipeline systems to notify the U.S. Department of Transportation of any reportable incident by telephone and then submit a written report within 30 days;
- Title 49, Code of Federal Regulations, Part 192, Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards, specifies minimum safety requirements for pipelines and includes material selection, design requirements, and corrosion protection. The safety requirements for pipeline construction vary according to the population density and land use which characterize the surrounding land. This part contains regulations governing pipeline construction, which must be, followed for Class 2 and Class 3 pipelines.

LOCAL AND REGIONAL

The Uniform Fire Code (UFC 1997) contains provisions regarding the storage and handling of hazardous materials in Articles 79 and 80. The most recent version of the UFC was in 1997. The City and County San Francisco (CCSF) adopted this version of the UFC into the municipal code in 1999. Section 8005.1 of Article 80 gives authority to the Chief of the San Francisco Fire Department to designate hazardous materials transportation routes.

The California Building Code contains requirements regarding the storage and handling of hazardous materials. The Chief Building Official must inspect and verify compliance with these requirements prior to issuance of an occupancy permit. A further discussion of these requirements is provided in the **Facility Design** portion of this document.

The San Francisco Health Code Article 21, Division II, section 1110 requires a current hazardous materials registration certificate be obtained for any facility which stores or uses hazardous materials in certain amounts. Section 1110.1 requires that a Hazardous Materials Plan be prepared consistent with the provisions of Section 25509 of the California Health and Safety Code and the federal EPCRA (SARA Title III, see above). Article 21a, section 1180 designates the Public Health Department as the CUPA for review and evaluation of RMPs prepared pursuant to the Cal-ARP Act.

Both a Safety Plan and a Risk Management Plan (RMP) to be prepared and submitted to the County Planning Department. In regards to seismic safety issues, the site is located in Seismic Risk Zone 4. Construction and design of buildings and vessels storing hazardous materials must conform to the 1997 Uniform Building Code, the 1998 California Building Code, and the San Francisco County Building Code.

SETTING

The proposed project is located the southeast area of the City and County of San Francisco. The site is located within the existing Potrero Power Plant and borders industrial areas lie to the north, south, and west. To the east and south is San Francisco Bay. Mixed land uses lie to the west and include commercial areas and a residential neighborhood. Hazardous materials use and transportation are associated with many of the commercial and industrial activities in the area. Thus, hazardous materials are commonly transported, stored, and used in the project vicinity. Access to the site is via Illinois and 23rd streets.

Several factors associated with the area in which a project is to be located affect its potential to cause public health impacts from an accidental release of a hazardous material. These include:

- local meteorology;
- terrain characteristics; and
- location of population centers and sensitive receptors relative to the project.

METEOROLOGICAL CONDITIONS

Meteorological conditions, including wind speed, wind direction and air temperature, affect the extent to which accidentally released hazardous materials would be dispersed into the air and the direction in which they would be transported. This affects the level of public exposure to such materials and the associated health risks. When wind speeds are low and stable, dispersion is severely reduced and can lead to increased localized public exposure.

Recorded wind speeds and ambient air temperatures are described in the air quality section of the AFC (§8.1). This data indicates that wind speeds below one meter per second and temperatures exceeding 80°F occur in the project area, albeit rarely owing to the temperate nature of the San Francisco Bay microclimate. Therefore, staff agrees with the applicant that use of F stability (stagnated air, very little mixing), one meter/second wind speed, and an ambient temperature of 106° F in its modeling analysis of an accidental release is an extremely conservative scenario and thus reflects worst case atmospheric conditions. Staff also believes that the Applicant's Alternative Scenario modeling input parameters (see Table 8.12-5 of the AFC) presents a more reasonable scenario of the dispersion of an accidental release.

TERRAIN CHARACTERISTICS

The location of elevated terrain (terrain above the power plant stack height) is often an important factor to be considered in assessing potential exposure. An emission plume resulting from an accidental release may impact high elevations before impacting lower elevations. Modeling of an accidental release of aqueous ammonia at the proposed facility indicates that significant concentrations would be confined to the facility property and that off-site concentrations – even at elevated locations – would be so low as to pose no hazard to the public. The project site and immediate vicinity (within 2000 feet) is mostly level terrain. The nearest elevated locations (the

slopes of Potrero Hill) are located approximately 2000 feet from the facility to the west. However, because modeling results show impacts are insignificant at the fenceline, elevated terrain is not an important factor affecting the modeled results of accidental releases of aqueous ammonia at this site.

LOCATION OF EXPOSED POPULATIONS AND SENSITIVE RECEPTORS

The general population includes many sensitive subgroups that may be at greater risk from exposure to emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses. In addition, the location of the population in the area surrounding a project site may have a large bearing on health risk. Table 8.12-1 and Map 8.6-1 (SECAL 2000a) lists and shows the locations of both populated areas and sensitive receptors in the project vicinity. The fenceline closest to the aqueous ammonia storage tank area is 250 feet to the south of the tanks. The nearest public receptor is the Warm Water Cove Public Access Area approximately 300 feet south of the facility fenceline.

The nearest commercial and residential receptors are both located approximately 1900 feet NW of the aqueous ammonia storage tanks. The nearest industry and office buildings are around 1400 feet and 1800 feet (respectively) to the west of the aqueous ammonia storage tanks. The nearest school is located 1/2 miles to the west, the nearest day care center 3/4 mile distant, and the nearest hospital is approximately one mile away.

ENVIRONMENTAL IMPACTS

Staff thoroughly reviewed and assessed the potential for the transportation, handling, and use of hazardous materials to impact the surrounding community. All chemicals and natural gas were evaluated.

METHODOLOGY

In order to assess the potential for released hazardous materials to travel off-site, and impact on the public, staff analyzed several aspects of the proposed use of these materials at the facility. Staff recognizes that some chemicals must be used that are toxic. Therefore, staff conducted its analysis by examining the need for hazardous materials, the choice of chemical to be used and its amount, the manner in which the applicant will use the chemical, the manner it will be transported to the facility and transferred to facility storage tanks, and the way the applicant chooses to store the material on-site. Staff reviewed the applicant's proposed engineering controls and administrative controls concerning hazardous materials usage. Engineering controls are those physical or mechanical systems (such as storage tanks or automatic shut-off valves) which can prevent a spill of hazardous material from occurring or which can limit the spill to a small amount or confine it to a small area. Administrative controls are those rules and procedures that workers at the facility must follow that will help to prevent accidents or keep them small if they do occur. Both engineering and administrative controls can act as methods of prevention or as methods of response and minimization. In both cases, the goal is to prevent a spill from moving off-site and causing harm to people.

Staff conducted a thorough review and evaluation of the applicant's proposed use of hazardous materials as described by the applicant in the AFC (Section 8.12) and in data responses. Staff's assessment followed the five steps listed below:

- Step 1: Staff reviewed the chemicals and the amounts currently on-site or proposed for use as listed in Tables 8.12-2, 8.12-3, and 8.12-4 of the AFC and determined the need and appropriateness of their use. If less toxic materials are available, staff suggested their use instead. [Table 8.12-2 lists those materials currently on-site, Table 8.12-3 lists petroleum-containing hazardous materials such as diesel fuel, and Table 8.12-4 lists the additional hazardous materials proposed for use on the site.]
- Step 2: Those chemicals, proposed for use in small amounts or whose physical state is such that there is virtually no chance that a spill would migrate off the site and impact the public, were removed from further assessment.
- Step 3: Measures proposed by the applicant to prevent spills were reviewed and evaluated. These included engineering controls such as automatic shut-off valves and different size transfer-hose couplings and administrative controls such as worker training and safety management programs.
- Step 4: Measures proposed by the applicant to respond to accidents were reviewed and evaluated. These measures also included engineering controls such as catchment basins and methods to keep vapors from spreading and administrative controls such as training emergency response crews.
- Step 5: Staff then analyzed the theoretical impacts on the public worst-case spill of hazardous materials even with the mitigation measures proposed by the Applicant. If the mitigation methods proposed by the applicant were found to be sufficient, no further mitigation would be required. If the proposed mitigation proposed by the Applicant were found to be insufficient to reduce the potential for adverse impacts to an insignificant level, staff would then propose additional prevention and response controls until the potential for causing harm to the public was reduced to an insignificant level. It is only at this point that staff can recommend that the facility be allowed to use hazardous materials.

PROJECT IMPACTS

As proposed, the facility will cause no significant risk of off-site impacts. Thus, the direct impacts of the project will not add to any existing accidental release risks.

SMALL QUANTITY HAZARDOUS MATERIALS

In conducting the analysis, staff determined in Steps 1 and 2 that some materials, although present at the proposed facility, pose a minimal potential for off-site impacts as they will be stored in a solid form or in smaller quantities or have very low toxicity. These hazardous materials were thus removed from further assessment. For example, one such group of chemicals are the scale inhibitors chosen for use at the site. Scale inhibitors are used to control and reduce the potential for scale and corrosion to form within the pipeline system. This group of chemicals includes the NALCO series of solutions, trisodium phosphate, nitrite or molybdate inhibitors, and sodium bisulfite. These chemicals are safer to use than others often used at other facilities for this purpose, such as hydrazine, and the applicant has thus chosen the most appropriate substitute. Staff has determined

that the potential for impacts on the public are insignificant if the applicant uses those scale inhibitors and corrosion controllers that contain only the active ingredients on the list. See Appendix C for a list of chemicals that will be used at the power plant.

During the construction phase of the project, the only hazardous materials proposed for use include phosphate or nitrate cleaning solutions, cleaning solvents, antifreeze, and pesticides. Any impact of spills or other releases of these materials will be limited to the site due to the small quantities involved and thus no further analysis of construction phase activities appears warranted.

The existing use of a small quantity of hydrogen gas (237 lbs.) poses a risk of explosion. However, the small quantity present and the results of previous modeling of the blast effects of a hydrogen tank explosion (for a similar facility in California) demonstrate that any blast effect will be confined to the site and not impact off-site. The Applicant indicates that the hydrogen cylinders will be stored in an area isolated from potential ignition sources.

After removing from consideration those chemicals that fit into Steps 1 and 2, staff continued with Steps 4 and 5 to review the only remaining hazardous materials: sulfuric acid, sodium hypochlorite, petroleum fuels, natural gas, and aqueous ammonia.

LARGE QUANTITY HAZARDOUS MATERIALS

According to the applicant (SECAL, 2000a), more than 5000 lb. of 29 percent Sulfuric acid will be used and stored on-site. This material does not pose a risk of off-site impacts because it has an extremely low vapor pressure and thus a spill would be confined to the site. Because of public concern at another proposed energy facility in 1995, staff conducted a quantitative assessment of the potential for impact associated with the use, storage, and transport of 93% sulfuric acid. Staff found no hazard would be posed to the public using this more concentrated form.

The aqueous mixture of sodium hypochlorite (30,000 gallons) will likewise have a low potential to affect the off-site public because its vapor pressure is also low and the concentration of hypochlorite is low (12.5 percent). In fact, hypochlorite is used at many such facilities as a substitute for chlorine gas, which is much more toxic and much more likely to migrate off-site because it is a gas and is stored in concentrated form. Thus, the use of a water solution of sodium hypochlorite is much safer to use than the alternative chlorine gas. However, accidental mixing of sodium hypochlorite with acids or aqueous ammonia could result in toxic gases. Given the large volumes of both aqueous ammonia (40,000 gals) and sodium hypochlorite (30,000 gals) proposed for storage at this facility, the chances for accidental mixing of the two - particularly during transfer from delivery vehicles to storage tanks - should be reduced as much as possible. Thus, measures to prevent such mixing are extremely important and will be required as an additional section within the required Safety Management Plan for delivery of aqueous ammonia (see Condition of Certification HAZ-3).

Large quantities (>20M gals) of petroleum-containing hazardous materials are presently used on this site. Fuels such as fuel oil #6, mineral oil, lube oil, and diesel fuel are all of very low volatility and impacts of spills are expected to remain on-site. A Spill Prevention Control and Countermeasure Plan (SPCC) is required by Federal Regulations (see LORS above) and has already been prepared for these petroleum-containing hazardous materials (see AFC section 8.12.1.2).

NATURAL GAS

Natural gas poses a fire and/or explosion risk as a result of its flammability. Natural gas is composed of mostly methane but also contains ethane, propane, nitrogen, butane, isobutane and isopentane. It is colorless, odorless, and tasteless and is lighter than air. Natural gas can cause asphyxiation when methane is ninety percent in concentration. Methane is flammable when mixed in air at concentrations of 5 to 14 percent, which is also the detonation range. Natural gas, therefore, poses a risk of fire and/or explosions if a release were to occur. However, it should be noted that, due to its tendency to disperse rapidly (Lees 1983), natural gas is less likely to cause explosions than many other fuel gases, such as propane or liquefied petroleum gas. While natural gas will be used in significant quantities, it will not be stored on-site.

The risk of a fire and/or explosion on-site can be reduced to insignificant levels through adherence to applicable codes and development and implementation of effective safety management practices. In particular, gas explosions can occur in the Heat Recovery Steam Generator (HRSG) and during start-up. The National Fire Protection Association (NFPA 85A) requires 1) the use of double block and bleed valves for gas shut-off; 2) automated combustion controls; and 3) burner management systems. These measures will significantly reduce the likelihood of an explosion in gas-fired equipment.

Additionally, start-up procedures will require air purging of the gas turbines prior to start-up, thus precluding the presence of an explosive mixture. The safety management plan proposed by the applicant will address the handling and use of natural gas and significantly reduce the potential for equipment failure due to improper maintenance or human error. Since the proposed facility will not require the installation of any new gas pipelines off-site, impacts from a break in the pipeline are limited to the existing pipelines already in use in the area or in the new pipeline to be installed on-site. The design of the natural gas pipeline is governed by laws and regulations discussed in staff's **Facility Design** analysis. Thus, the only new gas pipelines installed for the proposed project will be placed on-site where the risk of natural gas accidents can be better controlled and minimized. Therefore, the use of natural gas at the proposed facility will not result in adverse off-site impacts.

AQUEOUS AMMONIA

Aqueous ammonia will be used in controlling the emission of oxides of nitrogen (NO_x) from the combustion of natural gas in the facility. The accidental release of aqueous ammonia without proper mitigation can result in hazardous down-wind concentrations of ammonia gas. Two 20,000 gallon tanks will be used to store the 29.4 percent aqueous ammonia.

Based on the screening analysis discussed above, aqueous ammonia is the only hazardous material that may pose a risk of off-site impacts. The use of aqueous ammonia can result in the formation and release of toxic gases in the event of a spill even without interaction with other chemicals. This is a result of its relatively high vapor pressure and the large amounts of aqueous ammonia which will be used and stored on-site. However, as with aqueous hypochlorite, the use of aqueous ammonia instead of the much more hazardous anhydrous ammonia (i.e. ammonia that is not diluted with water) poses far less risk. .

To assess the potential impacts associated with an accidental release of ammonia, staff typically evaluates where four “bench mark” exposure levels of ammonia gas occur off-site. These include: 1) the lowest concentration posing a risk of lethality, 2,000 ppm; 2) the Immediately Dangerous to Life and Health (IDLH) level of 300 ppm; 3) the Emergency Response Planning Guideline (ERPG) level 2 of 150 ppm (recently changed from the 200 ppm value), which is also the RMP level 1 criterion used by USEPA and California; and 4) the level considered by the Energy Commission staff to be without serious adverse effects on the public for a one-time exposure of 75 ppm. (A detailed discussion of the exposure criteria considered by staff and their applicability to different populations and exposure-specific conditions is provided in Appendix A of this analysis.) If the potential exposure associated with a potential release exceeds 75 ppm at any public receptor, staff will presume that the potential release poses a risk of significant impact. However, staff will also assess the probability of occurrence of the release and/or the nature of the potentially exposed population. Staff may, based on such analysis, determine that the likelihood and extent of potential exposure are not sufficient to support a finding of potentially significant impact.

The AFC (section 8-12.2.2.3) provided the results of modeling for a worst case and alternative case accidental release of aqueous ammonia. The worst-case release scenario postulated a spontaneous catastrophic failure of the entire 20,000 gallon contents of one of the two storage tanks. In conducting this analysis, it was assumed that spilled material would be contained in the covered basin below the storage vessel and tanker truck pad and that winds of 1.0 meters per second and atmospheric stability category F would exist at the time of the accidental release. An air temperature of 106° F was assumed. The USEPA SCREEN3 air dispersion model was used to estimate airborne concentrations of ammonia. These analyses were designed to predict the maximum possible impacts based on distance from the storage tank without regard to specific direction of transport.

The alternative analysis consists of the accidental release of 8,000 gallons of aqueous ammonia from the delivery tanker truck during transfer to the storage tanks. The spilled ammonia would flow to the same covered collection sump as in the worst-case scenarios but more realistic meteorological conditions were used as inputs to the SCREEN 3-air dispersion model. Atmospheric Stability Class D (instead of the more conservative F) was used, a lower ambient temperature was assumed (57.1° F vs. 106° F), and a wind speed of 3 m/s was assumed instead of 1 m/s.

The results indicated that concentrations exceeding 75 PPM would be confined to the project site (less than 164 feet from the storage tanks for the worst-case and 95 feet for the alternative scenario). Airborne ammonia concentrations were also estimated at the nearest fenceline (~3.75 ppm worst-case and ~1.1 ppm alternative scenario). In response to data requests (SAEJ2000DReq1, Data Request No.118), the applicant (Mirant2001DResSAEJ, Data Response No.118) indicated that airborne concentrations under the worst-case scenario would be 34 ppm at the southern fenceline (which is the nearest fenceline to the storage tanks) and 8 ppm at the park located 300 feet to the south.

Because of these discrepancies in reporting the results of the off-site consequence modeling, staff conducted its own modeling using the SCREEN3 air dispersion model. The results of this analysis confirm that the 75 ppm criteria would be reached at 162 feet from the storage tanks as stated in the AFC. Staff was also able to confirm the levels stated in the data response to SAEJ that the airborne concentration at the nearest fenceline (250 feet from the tanks) would be 32 ppm and that the concentration at the park located 500 feet from the tanks to the south would be 8.7 ppm. Staff estimated airborne concentrations at other receptors as: 0.8 ppm at the nearest commercial and residential receptors (~1900 feet NW of the storage tanks), 1.3 ppm at the nearest industry (~1400 feet from the tanks), 0.46 ppm at the nearest school (~1/2 mile from the tanks), 0.24 ppm at the nearest day care center (~3/4 mile distant), and 0.16 ppm at the nearest hospital (~1 mile away). This analysis confirms the applicant's contention that a catastrophic failure of an aqueous ammonia storage tank would not result in adverse impacts to off-site receptors. Referring to Appendix B of this staff assessment, it is doubtful that most people would even notice an odor during such an event.

SEISMIC ISSUES

Concern exists over the possibility that an earthquake would cause the failure of a hazardous materials storage tank. The quake could also cause the failure of the secondary containment system (berms and dikes) as well as electrically controlled valves, pumps, neutralization systems and the foam vapor suppression system. The failure of all these preventive control measures might then result in a vapor cloud of hazardous materials moving off-site and impacting the residents and workers in the surrounding community. This concern over earthquake safety is heightened by the Loma Prieta earthquake of 1989, the Northridge earthquake of 1994, and the earthquake in Kobe, Japan in January 1995.

Information obtained after the January 1994 Northridge earthquake showed that some damage was caused to several large storage tanks and smaller tanks associated with the water treatment system of a cogeneration facility. Those tanks with the greatest damage - including seam leakage - were older tanks while the newer tanks sustained displacements and failures of attached lines. Therefore, staff conducted an analysis of the codes and standards, which should be followed in adequately designing and building storage tanks and containment areas to withstand a large earthquake. Referring to the sections on GEOLOGIC HAZARDS and FACILITY DESIGN in the AFC, staff notes that the proposed facility will be

designed and constructed to the applicable standards of the Uniform Building Code for Seismic Zone 4.

TRANSPORTATION OF HAZARDOUS MATERIALS

The transportation of hazardous materials to the facility is of great concern to the residents and workers in the surrounding community. Concern over the potential for an accident involving a delivery vehicle and a resultant chemical spill has been expressed. Hazardous materials including aqueous ammonia, sulfuric acid, and sodium hypochlorite will be transported to the facility via tanker truck. While many types of hazardous materials will be transported to the site it is staff's belief that transport of aqueous ammonia poses the predominance of risk associated with such transport.

Aqueous ammonia would be delivered to the facility by tanker truck and thus it is possible that ammonia can be released during a transportation accident. The extent of impact in the event of such a release would depend on the location and on the rate of dispersion of ammonia vapor from the surface of the aqueous ammonia pool. The likelihood of an accidental release during transport is dependent on three factors:

1. the skill of the tanker truck driver,
2. the type of vehicle used for transport, and on
3. accident rates.

To address this concern, staff evaluated the risk of an accidental transportation release in the project area. Staff's analysis focused on the project area after the delivery vehicle leaves the main highway. Staff believes that it is appropriate to rely on the extensive regulatory program that applies to shipment of hazardous materials on California Highways to ensure safe handling in general transportation (see The Federal Hazardous Materials Transportation Law 49 USC §5101 et seq, The US Department of Transportation Regulations 49 CFR Subpart H, §172-700, and California DMV Regulations on Hazardous Cargo). These regulations also address the issue of driver competence. (See AFC section 8.10 for additional information on regulations governing the transportation of hazardous materials.)

To address the issue of tank truck safety, aqueous ammonia will be delivered to the proposed facility in Department of Transportation (DOT) certified vehicles with design capacity of 8000 gallons. These vehicles will be designed to DOT Code MC-307. These are high integrity vehicles designed for hauling of caustic materials such as ammonia. Staff has therefore proposed a Condition of Certification (HAZ-5) to ensure that regardless of which vendor supplies the aqueous ammonia, delivery will be made in a tanker which meets or exceeds the specifications described by these regulations.

To address the issue of accident rates, staff reviewed the technical and scientific literature on hazardous materials transportation (including tanker trucks) accident rates in the United States and California. Staff relied on the following references to

determine the approach to preparing a hazardous materials transportation accident risk analysis:

Rhyne, W.R. 1994. Hazardous Materials Transportation Risk Analysis. Quantitative Approaches for Truck and Train.
Chapter 2: Transportation Quantitative Risk Analysis
Chapter 3: Databases

Davies, P.A. and Lees, F.P. 1992. "The Assessment of Major Hazards: The Road Transport Environment for Conveyance of Hazardous Materials in Great Britain." Journal of Hazardous Materials, 32: 41-79.

Harwood, D.W., Viner, J.G., and E.R. Russell. 1990. "Truck Accident Rate Model for Hazardous Materials Routing." Transportation Research Record. 1264: 12-23.

Harwood, D.W., Viner, J.G., and E.R. Russell. 1993. "Procedure for Developing Truck Accident and Release Rates for Hazmat Routing." Journal of Transportation Engineering. 119(2): 189-199.

Vilchez, J.A., Sevilla, S., Montiel, H. and J. Casal. 1995. "Historical Analysis of Accidents in Chemical Plants and in the Transportation of Hazardous Materials." J. Loss Prev. Process Ind. 8(2): 87-96

Pet-Armacost, J.J., Sepulveda, J. and M. Sakude. 1999. "Monte Carlo Sensitivity Analysis of Unknown Parameters in Hazardous Materials Transportation Risk Assessment." Risk Analysis. 19(6): 1173-1184.

National Response Center
Chemical Incident Reports Center, U.S. Chemical Safety Board
National Transportation Safety Board

Staff used data from the Davies and Lee (1992) article which references the 1990 Harwood study to determine that the frequency of release for transportation of hazardous materials in the U.S. is between 0.06 and 0.19 releases per million miles traveled on well designed roads and highways. The same source provides estimates of the probability that such an event will occur at random in a location where a large number of people would be present and exposed within a large urban environment. It is estimated that about 8.9 percent of such incidents would result in more than 10 fatalities and that less than 1.4 percent would involve more than 33 fatalities. Thus the maximum risk of an accident causing more than 10 fatalities is about 0.017 (0.19×0.089) in one million per tanker mile traveled. The maximum risk of such an accident causing 33 or more fatalities is less than 0.0027 (0.19×0.014) in one million per tanker mile traveled. This does not include any mitigating affect resulting from meteorological conditions existing at the time of the event that frequently result in rapid dispersion of released materials mitigating potential impacts.

Assuming maximum usage of aqueous ammonia each year of operation of the proposed Potrero Power Plant facility, it will require about 73 tanker truck deliveries

of aqueous ammonia per year (one truck every 5 days). Each truck delivery will travel about 2 miles between Interstate 280 and the facility per year (a specific transportation route will be required by Condition of Certification Haz-6). The result is ~146 miles of delivery truck travel in the project area per year. Thus, the maximum risk of accidental release and potential fatality of more than 10 people in the project area is less than 2.5 in one million per year and the risk of fatality of more than 33 people is less than 0.4 in one million.

Staff uses a significance threshold of 1 in 100,000 for risk of 10 fatalities and a threshold of 1 in 1,000,000 for risk of 100 fatalities. Both upper-bound risk estimates (0.25 and 0.4 in one million) are less than these thresholds. And in fact, data from the U.S. DOT show that the actual risk of a fatality over the past five years from all modes of hazardous material transportation (rail, air, boat, and truck) was approximately 0.1 in one million.

Staff therefore believes the risk of exposure to significant concentrations of aqueous ammonia during transportation to the facility are insignificant because of the remote possibility of accidental release of a sufficient quantity to present a danger to the public. The transportation of similar volumes of hazardous materials on the nation's highways is not unique nor an infrequent occurrence. Staff's analysis of the transportation of aqueous ammonia to the proposed facility (along with data from the U.S. DOT) demonstrates that the risk of accident and exposure is far less than those associated with many activities that the public readily accepts.

Based on the environmental mobility, toxicity, quantities present at the site and frequency of delivery, it is staff's opinion that aqueous ammonia poses the predominate risk associated with hazardous materials transportation and use at the proposed facility. Based on this, staff concludes that the risk associated with transportation of other hazardous materials to the proposed facility does not significantly increase the risk of impact beyond that associated with ammonia transportation.

Staff also finds that restricting the route of transportation would be important in keeping the risks of accidents to negligible levels. Accordingly, staff proposes a Condition of Certification (HAZ-6) that requires the applicant to identify the preferred hazardous materials transportation route and obtain approval from the CPM before hazardous materials are delivered to the facility.

CUMULATIVE IMPACTS

Staff reviewed the potential for the operation of Unit 7 combined with existing industrial facilities to result in cumulative impacts on the population within the area. Projects that could potentially contribute to cumulative impacts are those located in the same geographic area of influence defined as within a 1-mile radius of the proposed power plant. Because there already exists a power generation facility on this site, the risks and hazards surrounding the transportation and use of hazardous materials has already been addressed for the existing facility and for the surrounding industries. Staff finds that the addition of the proposed Unit 7 to this site would not add significant cumulative impacts to those already encountered and

addressed. Staff finds that the facility, as proposed by the Applicant and with the additional mitigation measures proposed by the Staff, poses a minimal risk of accidental release during transport, storage, and use which could result in off-site impacts. Therefore, the direct impacts of the project will not add to any existing risk of accidental release.

Staff reviewed the demographic information provided in the Socioeconomics section of this PSA in relation to the location(s) around the proposed power plant that have the potential to receive a significant hazardous materials impact. Based on information collected during the course of this analysis from community members and from governmental sources, staff has determined that, with the implementation of mitigation proposed under staff's Proposed Conditions of Certification, there will not be an unmitigated disproportionate impact on a minority or low-income population.

APPLICANT'S PROPOSED MITIGATION

The potential for accidents resulting in the release of hazardous materials is greatly reduced by the implementation of a safety management program, which includes the use of both engineering and administrative controls. Administrative controls include the development and implementation of a Safety Management Plan. Elements of facility controls and the safety management plan are summarized below.

ENGINEERING CONTROLS

Engineering controls help to prevent accidents and releases (spills) from moving off-site and impacting the community by incorporating engineering safety design criteria into the design of the facility. The engineered safety features proposed by the applicant for use at this facility include:

- construction of curbs, berms, and/or catchment basins in the hazardous materials storage areas to contain accidental releases that might happen during storage or delivery;
- physical separation of stored chemicals in separate containment areas in order to prevent accidental mixing of incompatible materials which may result in the evolution and release of toxic gases or fumes;
- a 2,024 square foot containment area which will surround the two 20,000 gallon aqueous ammonia storage tanks and which will drain into a sump large enough to hold 37,163 gallons;
- a sloped containment pad for the aqueous ammonia tanker truck delivery area that will drain into the same subsurface covered sump placed beneath the storage tanks; and
- process protective systems including automatic shut-off valves, double-wall piping, and fire protection systems.

ADMINISTRATIVE CONTROLS

Administrative controls also help to prevent accidents and releases (spills) from moving off-site and impacting the community by establishing worker training programs and process safety management programs and by complying with all applicable health and safety laws, ordinances and standards.

The worker health and safety program proposed by the Applicant for use at this facility will include (but is not limited to) the following elements:

- worker training regarding chemical hazards, health and safety issues, and hazard communication;
- the proper use of personal protective equipment;
- safety operating procedures for operation and maintenance of systems utilizing hazardous materials;
- fire safety and prevention; and emergency response actions including facility evacuation, hazardous material spill cleanup, and fire prevention.

At the facility, the project owner will designate an individual who has the responsibility and authority to ensure a safe and healthful workplace. The project health and safety professional oversees the health and safety program and has the authority to halt any action or modify any work practice in order to protect the workers, facility, and the surrounding community or in the event that the health and safety program is violated.

The facility Process Safety Management Program includes a program for the regular inspection and maintenance of equipment, valves, piping, and appurtenances. Additionally, the process safety management program requires that only trained facility personnel are assigned to the transfer and handling of hazardous chemicals.

The facility will also prepare a Hazardous Materials Business Plan and a Risk Management Plan (RMP).

ON-SITE SPILL RESPONSE

In order to address the issue of spill response, the facility will prepare and implement an Emergency Response Plan which includes information on: hazardous materials contingency and emergency response procedures, spill containment and prevention systems, personnel training, spill notification, on-site spill containment, prevention equipment and capabilities, etc. Emergency procedures will be established which include evacuation, spill cleanup, hazard prevention, and emergency response.

STAFF MITIGATION

The worst-case accidental release scenario evaluated by the applicant in the AFC assumed that accidental spills would occur from the storage vessel into the basin below the storage vessel or from a tanker truck into the same catchment system.

Staff believes that the most likely event resulting in a spill would be during transfer from the delivery tanker to the storage tank. Staff therefore proposes a condition (HAZ-3) requiring development of a safety management plan for the delivery of aqueous ammonia. The development of a Safety Management Plan addressing delivery of ammonia will further reduce the risk of any accidental release not addressed by the proposed spill prevention mitigation measures and the required Risk Management Plan (RMP).

Staff has thoroughly evaluated the applicant's proposed handling, storage, and transfer methods for aqueous ammonia and the applicant's off-site consequence analysis. Staff is confident that when implemented, the applicant's safety program will keep accidental releases to a minimum and keep those which do occur from impacting the off-site public. An evacuation plan will be prepared by the Applicant as part of the safety plans it must develop. Therefore, no further mitigation is warranted.

FACILITY CLOSURE

The requirements for handling of hazardous materials remain in effect until such materials are removed from the site regardless of facility closure. Therefore, the facility owners are responsible for continuing to handle such materials in a safe manner, as required by applicable laws. In the event that the facility owner abandons the facility in a manner, which poses a risk to surrounding populations, staff will coordinate with the California Office of Emergency Services, San Francisco County Environmental Health Department, and the California Department of Toxic Substances Control (DTSC) to ensure that any unacceptable risk to the public is eliminated. Funding for such emergency action can be provided by federal, state or local agencies until the cost can be recovered from the responsible parties (O.E.S. 1990).

CONCLUSIONS AND RECOMMENDATIONS

Staff's evaluation of the proposed project (with staff's proposed mitigation measures) indicates that hazardous materials use will pose no potential for significant impacts on the public. With adoption of the proposed conditions of certification, the proposed project will comply with all applicable laws, ordinances, regulations and standards (LORS). In response to Health and Safety Code, section 25531 et seq., the applicant will be required to develop an RMP. The RMP will be submitted to EPA, San Francisco County, and staff for evaluation. To insure adequacy of the RMP, staff's proposed conditions of certification require that the RMP be submitted for concurrent review by USEPA, San Francisco County and staff. In addition, staff's proposed conditions of certification also require San Francisco County's acceptance of the RMP and staff's approval of the RMP prior to delivery of any hazardous materials to the facility. With adoption of staff's proposed conditions of certification, the project will also comply with Health and Safety Code, section 41700, and it will not pose any potential for significant impacts to the public from hazardous materials releases.

Staff recommends the Energy Commission impose the proposed conditions of certification, presented herein, to ensure that the project is designed, constructed and operated to comply with applicable LORS and to protect the public from significant risk of exposure to an accidental ammonia release.

PROPOSED CONDITIONS OF CERTIFICATION

HAZ-1 The project owner shall not use any hazardous material at the Potrero PP Unit 7 not listed in Appendix C, below, or in greater quantities or strengths than those identified by chemical name in Appendix C, below, unless approved in advance by the City and County of San Francisco and the CPM.

Verification: The project owner shall provide to the Compliance Project Manager (CPM), in the Annual Compliance Report, a list of hazardous materials contained at the facility in reportable quantities.

HAZ-2 The project owner shall provide a Risk Management Plan to the City of San Francisco and the CPM for review at the time the plans are first submitted to the U.S. Environmental Protection Agency (USEPA). The project owner shall include all recommendations of and the CPM in the final document. A copy of the final plans, including all comments, shall be provided to the City and County of San Francisco and the CPM once approved by USEPA.

Verification: At least sixty (60) days prior to the delivery of aqueous ammonia to the proposed storage facility which will be used in the future to provide aqueous ammonia to the Potrero Power Plant, the project owner shall provide the final plans listed above and accepted by the City and County of San Francisco and approved by USEPA to the CPM for approval.

HAZ-3 The project owner shall develop and implement a Safety Management Plan for delivery of ammonia. The plan shall include procedures, protective equipment requirements, training and a checklist. It shall also include a section describing all measures to be implemented to prevent mixing of aqueous ammonia with incompatible hazardous materials.

Verification: At least sixty (60) days prior to the delivery of aqueous ammonia to the ammonia storage tanks which will be used by the Unit 7 facility in the future, the project owner shall provide a safety management plan as described above to the CPM for review and approval.

HAZ-4 The aqueous ammonia storage facility shall be designed to either the ASME Pressure Vessel Code and ANSI K61.6 or to API 620. In either case, the storage tank shall be protected by a secondary containment basin capable of holding 150% of the storage volume plus the volume associated with 24 hours of rain assuming the 25-year storm.

Verification: At least sixty (60) days prior to delivery of aqueous ammonia to the storage tanks, the project owner shall submit final design drawings and specifications for the ammonia storage tank and secondary containment basin to the CPM for review and approval.

HAZ-5 The project owner shall direct all vendors delivering aqueous ammonia to the site to use only transport vehicles which meet or exceed the specifications of DOT Code MC-307.

Verification: At least sixty (60) days prior to receipt of aqueous ammonia on site, the project owner shall submit copies of the notification letter to supply vendors indicating the transport vehicle specifications to the CPM for review and approval.

HAZ-6 The project owner shall direct all vendors delivering any hazardous material to the site to use only the route(s) approved by the CPM.

Verification: At least sixty (60) days prior to receipt of any hazardous materials on site; the project owner shall submit to the CPM for review and approval copies of the required transportation route to be used for transporting hazardous materials.

REFERENCES

- AIChE (American Institute of Chemical Engineers). 1989. Guidelines for Technical Management of Chemical Process Safety, AIChE, New York, NY 10017.
- AIChE (American Institute of Chemical Engineers). 1994. Guidelines for Implementing Process Safety Management Systems, AIChE, New York, NY 10017.
- API (American Petroleum Institute). 1990. Management of Process Hazards, API Recommended Practice 750; American Petroleum Institute, First Edition, Washington, DC, 1990.
- Baldcock, P.J. (date unknown). Accidental Releases of Ammonia: An Analysis of Reported Incidents. (unknown source).
- Davies, P.A. and Lees, F.P. 1992. "The Assessment of Major Hazards: The Road Transport Environment for Conveyance of Hazardous Materials in Great Britain." Journal of Hazardous Materials, 32: 41-79.
- EPA (Environmental Protection Agency). 1987. Technical Guidance for Hazards Analysis, Environmental Protection Agency, Washington, DC, 1987.
- EPA (Environmental Protection Agency). 1988. Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Environmental Protection Agency, Research Triangle Park, NC, 1988.
- FEMA (Federal Emergency Management Agency). 1989. Handbook of Chemical Hazard Analysis Procedures, Federal Emergency Management Agency, Washington, DC, 1989.
- Harwood, D.W., Viner, J.G., and E.R. Russell. 1990. "Truck Accident Rate Model for Hazardous Materials Routing." Transportation Research Record. 1264: 12-23.
- Harwood, D.W., Viner, J.G., and E.R. Russell. 1993. "Procedure for Developing Truck Accident and Release Rates for Hazmat Routing." Journal of Transportation Engineering. 119(2): 189-199.
- Lees, F.P. 1998). Loss Prevention in the Process Industries, Vols. I, II and III. Second Edition, Butterworths.
- Mirant (Mirant Corporation). Mirant2001DResSAEJ. Mirant responses to Southeast Alliance for Environmental Justice, Data Requests, Set 1, Nos. 1 through 155, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission February 27, 2001.

- NFPA (National Fire Protection Association). 1987. NFPA 85A, Prevention of Furnace Explosions in Fuel Oil and Natural Gas Fired Single Burner Boiler Furnaces, National Fire Protection Association, Batterymarch Park, Quincy, MA, 1987.
- NRC (National Research Council). 1979. Ammonia. Subcommittee on Ammonia. Committee on Medical and Biologic Effects of Environmental Pollutants. Division of Medical Sciences, Assembly of Life Sciences, National Research Council (NRC), Baltimore, Maryland, University Park Press (NTIS No. PB 278-027).
- Perry. 1973. Perry's Chemical Engineers' Handbook, Sixth Edition, McGraw-Hill, USA.
- Pet-Armacost, J.J., Sepulveda, J. and M. Sakude. 1999. "Monte Carlo Sensitivity Analysis of Unknown Parameters in Hazardous Materials Transportation Risk Assessment." Risk Analysis. 19(6): 1173-1184.
- Rhyne, W.R. 1994. Hazardous Materials Transportation Risk Analysis. Quantitative Approaches for Truck and Train. Belmont, CA: Van Nostrand Reinhold.
- SAEJ (Southeast Alliance for Environmental Justice). SAEJ2000DReq1. Southeast Alliance for Environmental Justice, Data Requests, Set 1, Nos. 1 through 155, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to Southern Energy California, November 21, 2000, and docketed with the California Energy Commission, November 27, 2000.
- SECAL (Southern Energy California). 2000a. Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, May 31, 2000.
- SECAL (Southern Energy California). 2000b. Supplemental Information in Response to CEC Data Adequacy Request, Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, August 31, 2000.
- SECAL (Southern Energy California). 2001a. Amendment to the Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Addresses the demolition of six existing structures. Submitted to the California Energy Commission, January 19, 2001.
- Uniform Fire Code (UFC) 1997. International Fire Code Institute, Whittier, Ca.
- USOSHA (United States Occupational Safety and Health Administration). 1993. Process Safety Management / Process Safety Management Guidelines For Compliance. U.S. Department of Labor, Washington, DC.

Vilchez, J.A., Sevilla, S., Montiel, H. and J. Casal. 1995. "Historical Analysis of Accidents in Chemical Plants and in the Transportation of Hazardous Materials." J. Loss Prev. Process Ind. 8(2): 87-96

APPENDIX A

HAZARDOUS MATERIAL MANAGEMENT

BASIS FOR STAFF'S USE OF 75 PPM AMMONIA EXPOSURE CRITERIA

Staff uses a health-based airborne concentration of 75 ppm to evaluate the significance of impacts associated with potential accidental releases of ammonia. While this level is not consistent with the 200-ppm level used by EPA and Cal/EPA in evaluating such releases pursuant to the Federal Risk Management Program and State Accidental Release Program, it is appropriate for use in staff's CEQA analysis. The Federal Risk Management Program and the State Accidental Release Program are administrative programs designed to address emergency planning and ensure that appropriate safety management practices and actions are implemented in response to accidental releases. However, the regulations implementing these programs do not provide clear authority to require design changes or other major changes to a proposed facility. The preface to the Emergency Response Planning Guidelines (ERPGs) states that "these values have been derived as planning and emergency response guidelines, **not** exposure guidelines, they do not contain the safety factors normally incorporated into exposure guidelines. Instead they are estimates, by the committee, of the thresholds above which there would be an unacceptable likelihood of observing the defined effects." It is staff's contention that these values apply to healthy adult individuals and are levels that should not be used to evaluate the acceptability of avoidable exposures for the entire population. While these guidelines are useful in decision making in the event that a release has already occurred (for example, prioritizing evacuations), they are not appropriate for and are not binding on discretionary decisions involving proposed facilities where many options for mitigation are feasible. CEQA requires permitting agencies making discretionary decisions to identify and mitigate potentially significant impacts through changes to the proposed project.

Staff has chosen to use the National Research Council's 30 minute Short Term Public Emergency Limit (STPEL) for ammonia to determine the potential for significant impact. This limit is designed to apply to accidental unanticipated releases and subsequent public exposure. Exposure at this level should not result in serious effects but would result in "strong odor, lacrimation, and irritation of the upper respiratory tract (nose and throat), but no incapacitation or prevention of self-rescue." It is staff's opinion that exposures to concentrations above these levels pose significant risk of adverse health impacts on sensitive members of the general public. It is also staff's position that these exposure limits are the best available criteria to use in gauging the significance of public exposures associated with potential accidental releases. It is, further, staff's opinion that these limits constitute an appropriate balance between public protection and mitigation of unlikely events, and are useful in focusing mitigation efforts on those release scenarios that pose real potential for serious impacts on the public. Table 1 provides a comparison of the intended use and limitations associated with each of the various criteria that

staff considered in arriving at the decision to use the 75-ppm STPEL. Appendix B provides a summary of adverse effects which might be expected to occur at various airborne concentrations of ammonia.

HAZARDOUS MATERIAL MANAGEMENT

APPENDIX A TABLE 1

Acute Ammonia Exposure Guidelines

Guideline	Responsible Authority	Applicable Exposed Group	Allowable Exposure Level	Allowable* Duration of Exposures	Potential Toxicity at Guideline Level/Intended Purpose of Guideline
IDLH ²	NIOSH	Workplace standard used to identify appropriate respiratory protection.	300 ppm	30 min.	Exposure above this level requires the use of "highly reliable" respiratory protection and poses the risk of death, serious irreversible injury or impairment of the ability to escape.
IDLH/10 ¹	EPA, NIOSH	Work place standard adjusted for general population factor of 10 for variation in sensitivity	30 ppm	30 min.	Protects nearly all segments of general population from irreversible effects
STEL ²	NIOSH	Adult healthy male workers	35 ppm	15 min. 4 times per 8 hr day	No toxicity, including avoidance of irritation
EEGL ³	NRC	Adult healthy workers, military personnel	100 ppm	Generally less than 60 min.	Significant irritation but no impact on personnel in performance of emergency work; no irreversible health effects in healthy adults. Emergency conditions one time exposure
STPEL ⁴	NRC	Most members of general population	50 ppm 75 ppm 100 ppm	60 min. 30 min. 10 min.	Significant irritation but protects nearly all segments of general population from irreversible acute or late effects. One time accidental exposure
TWA ²	NIOSH	Adult healthy male workers	25 ppm	8 hr.	No toxicity or irritation on continuous exposure for repeated 8 hr. work shifts
ERPG-2 ⁵	AIHA	Applicable only to emergency response planning for the general population (evacuation) (not intended as exposure criteria) (see preface attached)	200 ppm	60 min.	Exposures above this level entail** unacceptable risk of irreversible effects in healthy adult members of the general population (no safety margin)

1) (EPA 1987) 2) (NIOSH 1994) 3) (NRC 1985) 4) (NRC 1972) 5) (AIHA 1989)

* The (NRC 1979), (WHO 1986), and (Henderson and Haggard 1943) all conclude that available data confirm the direct relationship to increases in effect with both increased exposure and increased exposure duration.

** The (NRC 1979) describes a study involving young animals, which suggests greater sensitivity to acute exposure in young animals. The (WHO 1986) warns that the young, elderly, asthmatics, those with bronchitis and those that exercise should also be considered at increased risk based on their demonstrated greater susceptibility to other non-specific irritants.

References for Appendix A, Table 1

AIHA. 1989. American Industrial Hygienists Association, Emergency Response Planning Guideline, Ammonia, (and Preface) AIHA, Akron, OH.

EPA. 1987. U.S. Environmental Protection Agency, Technical Guidance for Hazards Analysis, EPA, Washington, D.C.

NRC. 1985. National Research Council, Criteria and Methods for Preparing Emergency Exposure Guidance Levels (EEGL), short-term Public Emergency Guidance Level (SPEGL), and Continuous Exposure Guidance Level (CEGL) Documents, NRC, Washington, D.C.

NRC. 1972. Guideline for short-term Exposure of The Public To Air Pollutants. IV. Guide for Ammonia, NRC, Washington, D.C.

NIOSH. 1994. National Institute of Occupational Safety and Health, Pocket Guide to Chemical Hazards, U.S. Department of Health and Human Services, Washington D.C., Publication numbers 94-116.

WHO. 1986. World health Organization, Environmental Health Criteria 54, Ammonia, WHO, Geneva, Switzerland.

Abbreviations for Appendix A, Table 1

ACGIH, American Conference of Governmental and Industrial Hygienists
AIHA, American Industrial Hygienists Association
EEGL, Emergency Exposure Guidance Level
EPA, Environmental Protection Agency
ERPG, Emergency Response Planning Guidelines
IDLH, Immediately Dangerous to Life and Health Level
NIOSH, National Institute of Occupational Safety and Health
NRC, National Research Council
STEL, Short Term Exposure Limit
STPEL, Short Term Public Emergency Limit
TLV, Threshold Limit Value
WHO, World Health Organization

APPENDIX B

SUMMARY OF ADVERSE HEALTH EFFECTS OF AMMONIA

638 PPM

WITHIN SECONDS:

- significant adverse health effects;
- might interfere with capability to self rescue;
- reversible effects such as severe eye, nose and throat irritation.

AFTER 30 MINUTES:

- persistent nose and throat irritation even after exposure stopped;
- irreversible or long-lasting effects possible: lung injury;
- sensitive people such as the elderly, infants, and those with breathing problems (asthma) experience difficulty in breathing;
- asthmatics will experience a worsening of their condition and a decrease in breathing ability, which might impair their ability to move out of area.

266 PPM

WITHIN SECONDS:

- adverse health effects;
- very strong odor of ammonia;
- reversible moderate eye, nose and throat irritation.

AFTER 30 MINUTES:

- some decrease in breathing ability but doubtful that any effect would persist after exposure stopped;
- sensitive persons: experience difficulty in breathing;
- asthmatics: may have a worsening condition and decreased breathing ability, which might impair their ability to move out of the area.

64 PPM

WITHIN SECONDS:

- most people would notice a strong odor;
- tearing of the eyes would occur;
- odor would be very noticeable and uncomfortable.
- sensitive people could experience more irritation but it would be unlikely that breathing would be impaired to the point of interfering with capability of self rescue
- mild eye, nose, or throat irritation
- eye, ear, & throat irritation in sensitive people
- asthmatics might have breathing difficulties but would not impair capability of self rescue

22 OR 27 PPM

WITHIN SECONDS:

- most people would notice an odor;
- no tearing of the eyes would occur;
- odor might be uncomfortable for some;
- sensitive people may experience some irritation but ability to leave area would not be impaired;
- slight irritation after 10 minutes in some people.

4.0, 2.2, OR 1.6 PPM

- No adverse effects would be expected to occur;
- doubtful that anyone would notice any ammonia (odor threshold 5 - 20 ppm);
- some people might experience irritation after 1 hr.

APPENDIX C

[Attach AFC Tables 8.12-2, 8.12-3, and 8.12-4]

LAND USE

Jon Davidson, AICP

INTRODUCTION

The land use analysis of the Potrero Power Plan Unit 7 Project (Potrero PP) focuses on two main issues: the project's consistency with local land use plans, ordinances, and policies; and the project's compatibility with existing and planned land uses. In general, power plants have the potential to create impacts in the areas of noise, dust, public health, traffic, and visual impact, as well as other environmental areas. These individual resource topics are discussed in separate sections of this Preliminary Staff Assessment (PSA).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

STATE

There are no specific state-level land use LORS applicable to the project or the site. Applicable state and federal laws, regulations, and standards germane to specific resource areas, such as air quality or water quality, are addressed elsewhere in this PSA.

LOCAL

The site is situated wholly within the City and County of San Francisco (CCSF), and is adjacent to both San Francisco Bay and lands owned by the Port of San Francisco (Port). The land use at the site is under the jurisdiction of the CCSF. A portion of the site, land within 100 feet of the Bay, as well as submerged bay land that would be affected by the project are also under the jurisdiction of the Bay Conservation and Development Commission (BCDC). The site for the principal part of the generation project is outside BCDC's jurisdictional boundary; however, the proposed cooling water intake and discharge facilities are within the BCDC area.

Staff reviewed zoning, land use plans, and other development requirements of the City, the Port, and the BCDC.

BAY CONSERVATION AND DEVELOPMENT COMMISSION REVIEW

Pursuant to the McAteer-Petris Act, BCDC reviews all land use development proposals within the Bay that are on fill or involve new fill, or that are on land within 100 feet of the shoreline. Projects in this 100-foot shoreline band must provide maximum feasible public access to the Bay, consistent with the project. On a case-by-case basis, projects that require fill (i.e., placement of any material or structures on the bay bottom) may be required to mitigate their actions.

CITY AND COUNTY OF SAN FRANCISCO GENERAL PLAN

The San Francisco General Plan was adopted in 1996 and has been selectively amended since. The General Plan is the broadest planning document applicable to the site, expressing the broad goals and policies, and specific implementation

measures, to guide decisions on future growth, development, and conservation. The Potrero site is within the Central Waterfront Area Plan in the General Plan. **LAND USE Figure 1** shows the General Plan designations in this area, including the plant site and the transmission line route.

The General Plan designates the entire waterfront east of Third Street in this area for heavy industry, except for discontinuous units of shoreline land that are designated public open space. The Potrero PP site and the transmission line route to Hunters Point Substation are both within the heavy industry designated area.

West of Third Street, between Third Street and Interstate 280, the predominant designated General Plan use is Mixed Industrial/Commercial, with pockets of Public and Light Industry use.

Continuing west from I-280, the principal land use designation is Residential, followed by Light Industry, Public, and Neighborhood Commercial uses.

ZONING ORDINANCE

Zoning is the specific administrative tool used by a jurisdiction to implement its General Plan objectives. Zoning is often more finely defined than General Plan designations. **LAND USE Figure 2** shows the zoning applicable to the area of the project. The City and County of San Francisco has zoned the Potrero PP property as M-2 Heavy Industry. This zoning designation applies to all lands bay-ward of Third Street in the vicinity of the power plant. An RH-3 House Character District known as Dogpatch and an NC-2 Neighborhood Commercial zone occur on the east side of Third Street between 22nd and 23rd Streets. Because of housing pressures, the City has allowed a category of use known as "live/work" to occur throughout the City, regardless of the zoning designation. The exceptions are Residential zones and specifically designated Industrial Protection Zones. As a consequence, areas designated for a specific use, such as Commercial or Industrial, may also have live/work units situated within them. These live/work units are permitted under commercial rather than residential standards.

PORT PLANS

The Potrero PP site is one of the few properties along the shoreline not owned by the Port of San Francisco. While Port plans do not include the property, it is instructive to consider what is planned for nearby Port lands. The shoreline from China Basin to India Basin is identified by the Port as the Southern Waterfront¹. The Potrero PP site is in the center of this section of shoreline. Port property north of the Potrero PP site is designated for Mixed Use and Maritime Use. Property near

¹ Two designations apply to the Potrero PP site and vicinity. The Port designates its shoreline property from 18th Street south to India Basin as the Southern Waterfront. This includes all waterfront property except the Potrero site. The City General Plan designates the shoreline between China Basin and Islais Creek and the adjacent inland area as the Central Waterfront. The two designations overlap to a large degree along the waterfront. Although located between Port properties on the waterfront, as private property, the Potrero site is outside the Port's planning efforts.

LAND USE Figure 1
San Francisco General Plan Map
(Use Figure 8.4-1 from Potrero AFC)

LAND USE Figure 2
San Francisco Zoning Map
(Use figure 8.4-1 from Potrero AFC)

Illinois Street is planned as the Pier 70 Development Opportunity Area, with the potential for a wide range of office/commercial development. Port lands south of the Potrero site are planned for a mix of industrial, maritime, and transportation uses.

Certain aspects of the operation of the existing Potrero PP are governed by agreements with the Port of San Francisco. The power plant owner, Mirant Corp., has an agreement with the Port allowing the use of a portion of Port land for unloading fuel oil at Pier 70 and the delivery of the fuel to the plant through a pipeline. An agreement with the Port also allows the power plant owner to maintain intake and discharge facilities for cooling water over Port-owned land. New intake and discharge facilities for cooling water are proposed as part of the Potrero PP Unit 7 project, which will require a new agreement with the Port to maintain these new facilities on Port-owned land.

INTERIM AND ADVANCED PLANNING

The Central Waterfront is a dynamic area of the City. The City's Planning Department is analyzing pressures on the area for new uses, such as work/live residences, and may consider interim controls on growth in the area. Under a pilot Better Neighborhoods Program, three test areas in the City are being used to develop Area Specific Plans. The Central Waterfront is one of these test areas, and the Area Specific Plan is expected in 2002. Given the high value of land in the City, pressure to convert land and buildings to more intense uses puts pressure on industrial and fringe commercial property. An Industrial Protection Zone has been established in the vicinity that prohibits residential development in some parts of the Central Waterfront. However, the Potrero PP site is not within a protection zone. An application for a live/work project at 1300 Illinois Street (across the 23rd and Illinois intersection from the Potrero site) is seeking planning approval. As currently proposed, the project is for over 100 units. The City and the Port are considering an historic district designation for the area to preserve and enhance the historic and architectural character of many of the industrial and maritime structures found here.

DESIGN REVIEW

The Urban Design Element of the San Francisco General Plan provides design review guidance for major projects, setting out objectives and policies to guide and inform the design review process. For industrial and commercial projects, design review is conducted informally by the City during the permitting process. Considerations include bulk, height, shadow, vistas, facade treatment, and similar elements that affect the appearance of a development and its relationship to neighboring land uses and views. The Potrero site is within a General Plan area where design guidelines call for building heights from 44 to 88 feet. Port areas south of the Potrero site are designated as areas of 89 to 160 feet in height. (SF General Plan, Urban Design Element, pages I.5.34 & 35)

ENVIRONMENTAL SETTING

The project site is situated in southeastern San Francisco approximately 2,000 feet east of Interstate 280, in the midst of an industrial and port area. It is bounded by

Illinois Street and San Francisco Bay, between 22nd and 23rd Streets. Site access is by way of Humboldt Street, off of Illinois Street. The site houses four operating generation units, Units 3, 4, 5, and 6. Three fuel tanks are located on site. Two are emergency fuel storage for Unit 3, should natural gas service be interrupted and Unit 3 is forced to burn fuel oil. The third (center) tank provides distillate fuel for the smaller peaker units (nos. 4, 5, and 6). A building formerly enclosing a decommissioned and previously removed unit would be demolished to make way for the new Unit 7. Energy production at the site dates from the late 19th century.

The Potrero PP site is on one of the few bayside locations in the City's Central Waterfront Plan Area that is not Port property and, therefore, not within the Port's Southern Waterfront Plan. In April 1999, the Potrero facility was sold to Southern Energy California (which has subsequently changed its name to Mirant Corp.) by Pacific Gas and Electric Company (PG&E). The Potrero PP Unit 7 would be operated by Mirant Potrero LLC, a subsidiary of Mirant Corp.

Approximately 6.5 acres of the 20-acre Potrero PP site would be used for the new Unit 7. The generation units would be housed within a new building that would be erected on the part of the site now occupied by a group of abandoned buildings known as the Station A Complex. These vacant buildings have been judged to be seismically unstable and are planned to be removed as part of the siting case. The new building would be 131 feet high at its highest point and nearly 400 feet along its longest dimension parallel to Illinois Street. The facility design includes twin exhaust stacks 180 feet tall at the east side of the building. In addition to a new 115 kV switchyard onsite, transmission interconnections would be made to two existing PG&E Substations -- one the adjacent Potrero Substation, the other the PG&E Hunters Point Substation, 1.8 miles distant from the site. The latter substation would be reached by two 115 kV underground transmission circuits installed in Illinois Street, Cargo Avenue, and Jennings Street. The cable route would be directionally bored beneath Islais Creek.

SITE AND VICINITY DESCRIPTION

POTRERO POWER PLANT SITE

The entire Potrero PP site covers 20 acres between Illinois Street and the Bay. Existing generation assets at the site include Unit 3, a 206-MW steam turbine located near the bay, and Units 4, 5, and 6, three 52-MW combustion turbines that serve as "peaker" units. These three units are located mid-site and use distillate fuel. The proposed Unit 7 would be located between the peaker units and the existing PG&E Substation on Illinois Street.

EXISTING ADJACENT USES

LAND USE Figure 3 shows the existing land uses in the project vicinity. Potentially sensitive land uses within the affected area are shown in **LAND USE Table 1**. This table does not list residential properties or live/work units, which are discussed below.

Industrial and commercial uses predominate in the immediate site vicinity. Immediately north of the Potrero PP site is Pier 70, a Port of San Francisco property. Current uses at Pier 70 include general industry within an M-2 Heavy Industry zone. The eastern edge of the Potrero PP site abuts San Francisco Bay. The south side of the property is on 23rd Street, across which is found the old Spreckles Sugar building (vacant), an Airborne Express facility and an existing recycling facility. The west side of the property fronts on the existing PG&E Potrero Substation and Illinois Street, which has a rail line in it. Immediately across from the site on Illinois Street is a nearly block-long building that is being converted to commercial uses.

Third Street parallels Illinois Street one block west of the site. This marks the western boundary of the industrial area within which the Potrero PP is situated.

The relative scarcity of housing throughout San Francisco has led the City to allow live-work lofts in areas not zoned for residential use. As a result, the residential population in the project vicinity has increased through infiltration of live/work units. Since 1990, 25 dwelling units and 325 live/work units have been developed in the Central Waterfront. The 1990 census reported 214 dwelling units in the census tract covering the areas east of I-280.

The closest zoning-designated residential areas occur south and west of the Potrero PP. The Bayview-Hunters Point neighborhood is slightly over one mile south of the site, at its nearest point. To the west, closer residential areas occur on Potrero Hill, along Third Street, and in the small community known as Dogpatch on Third Street near 22nd Street. Dogpatch is the nearest zoned residential area to the project.

PLANNED LOCAL LAND USE CHANGES

The City and County of San Francisco and the Port of San Francisco are engaged in extensive planning and development activities in the vicinity of the Potrero PP site.

North of the Potrero PP site, at the Port of San Francisco's Pier 70 project, a Construction/Demolition Material Recovery Facility (MRF) is negotiating a development within an existing building. The Pier 70 plan also calls for mixed uses in the future, including approximately 610,000 square feet of commercial office and/or research and development space; 100,000 feet of retail/commercial space; and 240,000 square feet of public access and recreational uses. There is no set schedule for this development, however it is anticipated that about 150,000 square feet of arts and non-profits space is expected to be developed within the next two years, and 500,000 square feet of commercial space will be developed in the next 3-5 years.

To the south of the Potrero PP site, the City/County of San Francisco's Illinois Street Rail-Truck Bridge is planned for construction by the end of 2003. This intermodal bridge will improve transportation within the Port's lands, specifically

improving access to the Port's North Container Terminal on the north side of Islais Creek Channel.

On the south side of Islais Creek Channel, along Amador Street, a ready-mix concrete plant is planned between an existing sand processing plant and a rendering plant. The ready mix plant would include two 65-foot tall storage/mixer silos and other facilities. An asphalt plant is also planned on Amador Street. These Amador Street projects are awaiting final EIR certification to proceed. The EIR is being circulated.

To the west, the San Francisco Municipal Railway (MUNI) is well advanced with plans to construct the Third Street Light Rail Extension. Station stops along the route are expected to encourage commercial and, perhaps, residential development. In support of the new transit line, MUNI is constructing a maintenance and rail car storage facility on the Western Pacific site, approximately 1,000 feet south of the Potrero PP site. Site preparation work has begun on this site.

ENVIRONMENTAL IMPACTS

The Guidelines to the California Environmental Quality Act (CEQA), Appendix G, note that a project may have a significant effect on land use if the project will, among other things:

- Physically divide an established community, or,
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project.

A project may also have a significant impact on land use if it would create unmitigated noise, dust, public health hazard or nuisance, traffic or visual impacts, or when it precludes or unduly restricts existing or planned future uses.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

When determining if a project is in conformance with ordinances or regulations, Energy Commission staff typically meets and consults with applicable agencies to determine conformity and, when

necessary, "to attempt to correct or eliminate any noncompliance" (Pub. Resources Code, Sect. 25523(d)(1)). The land use laws, ordinances, regulations, standards (LORS) and policies applicable to the project have been analyzed below to determine the extent to which the Potrero PP Unit 7 project is consistent or at variance with each requirement or standard.

**LAND USE Figure 3
Existing Land Uses
(Use Figure 8.4-4 from Potrero AFC)**

LAND USE Table 1
Table of Potentially Sensitive Land Uses
(Use Table 8.4-2 on page 8.4-18 from Potrero AFC)

BAY CONSERVATION AND DEVELOPMENT COMMISSION SAN FRANCISCO BAY PLAN

The BCDC has jurisdiction over all bay fill and over land within 100 feet of the shoreline. The proposed intake and diffuser discharge system in this area would be considered fill by BCDC. On a case-by-case basis, BCDC negotiates mitigation, if any, for bay fill projects. Mitigation may be required on-site, if feasible, or off-site. Improving public access to the Bay is an important objective of the BCDC. The Bay Trail plan in the project vicinity designates Illinois Street as the trail route because of a lack of shoreline access. Where feasible, BCDC requires access to be provided proportional to the impact on access of a proposed project. Both Bay access and fill mitigation are determined on a project-specific basis. Provisions of public access to the waterfront and mitigation for installation of facilities in the bay bottom are yet to be determined in consultation with the applicant and BCDC.

SAN FRANCISCO GENERAL PLAN

The San Francisco General Plan contains ten elements, which set forth goals, policies, and objectives for the physical development of the City. The General Plan also includes Area Plans with objectives and policies for specific geographic areas of the City. The project site is in the Central Waterfront planning area that extends from Pier 48 in the north to Islais Creek in the south. The South Bayshore Plan governs land use policies and objectives south of Islais Creek.

The objectives and policies for the Central Waterfront are enumerated in the General Plan. The overall goals are to :

1. Increase employment opportunities for San Francisco's unemployed and under employed residents;
2. Enhance the working environment to stimulate business growth; and
3. Improve the area's appearance and attractiveness.

The Land Use, Industry, and Urban Design elements of the General Plan are applicable to the project; the objectives and policies for these elements that are germane to the Potrero PP proposal are listed below. Objectives and policies that do not relate to the power plant are omitted.

LAND USE

Objective 1: Strengthen and expand land uses essential to realizing the economic potential of the subareas. [The Potrero site is within the Central Basin sub area of the Central Waterfront Area Plan.]

- Policy 1: Encourage the intensification and expansion of industrial and maritime uses.
- Policy 2: Preserve and protect the subareas as a land base for San Francisco industry. Prevent the conversion of land needed for industrial or maritime activity to non-industrial use.

- Policy 3: Promote new development which has minimal adverse environmental consequences. Assure that the adverse environmental impacts of new development are fully mitigated.

Objective 2: Maintain and develop additional uses on land determined to be surplus to industrial and maritime needs.

- Policy 1: Preserve existing residential uses and develop limited new housing.
- Policy 2: Retain existing commercial uses and expand as needed to serve increases in the working and residential populations.
- Policy 3: Improve, expand, and develop recreational areas at established public access points along the waterfront enabling public use and enjoyment of the shoreline.

INDUSTRY

Objective 3: Retain, expand and protect industrial activity.

- Policy 1: Promote industrial expansion through maximizing and intensifying the use of existing facilities and properties, rehabilitating older industrial structures, and developing vacant land with industrial uses.
- Policy 3: Develop and promote training programs to target local residents for employment opportunities resulting from new economic development.
- Policy 8: Avoid encroachment of incompatible land uses on viable maritime-oriented and other industrial activity by appropriately zoning and mapping industrial districts. Resolve potential land use conflicts in a manner that recognizes the importance of industrial activity to the well-being of San Francisco.
- Policy 11: Attract new industries that create employment opportunities for City residents, add tax revenues in excess of public service costs, and strengthen and diversify San Francisco's economic base.

URBAN DESIGN

Objective 10: Achieve an aesthetic urban form consistent with the economic development of the subareas.

- Policy 1: Reinforce the visual contrast between the waterfront and hills by limiting the height of structures near the shoreline. Relate the height and bulk of new structures away from the shoreline to the character of the topography and existing development.
- Policy 2: Protect and create views of the downtown skyline and the Bay. Design and locate new development to minimize obstruction of existing views.
- Policy 3: Encourage the rehabilitation of architecturally or historically significant buildings with reuse potential.

CENTRAL BASIN SUBAREA

The Central Basin Subarea, which is the waterfront area east of Third Street and north of Twenty-fifth Street, has additional, specific objectives and policies applicable to it. Those germane to the Potrero PP are listed below.

Objective 16: Retain and expand industrial uses.

- Policy 2: Assure that any power plant expansion on the Pacific Gas and Electric Company [now Mirant Corp.] site will provide additional employment and will not adversely affect the environment.

Objective 18: Relate the scale of new development to San Francisco's distinctive hill form, to the adjacent waterfront, and to existing development.

- Policy 1: Minimize blockage of private and public views and maintain to the extent feasible, sightlines from Potrero Hill and Mission Bay to the waterfront and downtown.

SAN FRANCISCO ZONING ORDINANCE

The Potrero PP site is within an M-2 Heavy Industry use zone. Permitted uses include power plants. The site is within a 40-X Height and Bulk District, which imposes on development a height limit of 40 feet and a floor area ratio (FAR) of 5:1 (meaning a building may have a floor area equal to up to five times the site's square footage)

SAN FRANCISCO DESIGN REVIEW

Design review for industrial projects is conducted by the assigned City Planner. It is informal and relies on guidance provided in the General Plan. There is no specific design review checklist applicable to industrial projects. The assigned planner can call on an internal design review committee if he or she desires.

The proposed project complies with the laws, ordinances, and regulations discussed above. However, it is inconsistent with one City standard. The power generation building and the two exhaust stacks exceed the Height and Bulk criteria for the zoning district; but structures and equipment necessary for industrial operations are exempt under provisions of the City's Zoning Code. The Potrero PP proposal meets the requirements of the industrial zoning district and is exempt from this particular standard. Provision of public access to the waterfront and mitigation for installation of facilities in the bay bottom are yet to be determined in consultation with the applicant and BCDC.

COMPATIBILITY WITH EXISTING AND PLANNED LAND USES

POWER PLANT SITE

Power generation is an existing use at the Potrero PP site. The site is within a heavy industry zone and is bounded by industrial and port activities to the north and

south. To the west, an existing structure on Illinois Street is being converted to commercial (office) uses. The project represents further development of a site committed to industrial use and would not introduce a new industrial facility into a non-industrial area. The site and neighboring waterfront properties are designated in the General Plan and the Zoning Ordinance for heavy industry. Industrial uses are planned to continue in this area. Mixed commercial uses are encroaching on the area and, to the extent that land is not valued for industrial or port activities, Port officials are accommodating these changes within future plans being drafted or in the preliminary stages of development. Live/work units are allowed in most areas of the City regardless of zoning. Some units have been approved in the vicinity of the Potrero PP site. These are being allowed in full knowledge of the industrial and port nature of the existing land uses.

The construction lay down area for Potrero PP Unit 7 would be immediately east of the project site within the boundaries of the Potrero site, and therefore would not conflict with existing or planned land uses. Temporary, construction-related impacts, such as increased noise and dust, may affect adjacent land uses. With mitigation, these construction impacts are not expected to be significant. Please see the **AIR QUALITY** and **NOISE** sections of the PSA for discussions of impacts and mitigation.

Staff has found that operation of the Potrero PP Unit 7 would not cause significant, unmitigated adverse noise, dust, public health hazard or nuisance, or traffic impacts on nearby land uses.

The project would not alter any existing Bay waterfront access opportunities for the public; however, there may be opportunities to improve Bay access at the site or in the vicinity. The development of cooling water intake and discharge facilities constitute bay fill and may require some form of mitigation on- or off-site. An agreement with the Port of San Francisco to allow new intake and discharge facilities on Port-owned "intertidal" land will need to be obtained for the Potrero PP Unit 7 project.

ELECTRICAL TRANSMISSION LINES

The Potrero PP project would require offsite linear facilities (i.e., an underground transmission line to the PG&E Hunters Point Substation). This linear facility would be underground within public street rights of way and would be bored under Islais Creek. While construction would disrupt traffic along the transmission line route, it would have not adverse impact on land use following development. The route is within an industrial zone.

AGRICULTURE

The proposed plant site is located in San Francisco. The site and vicinity are urbanized and fully developed. There are no significant agricultural uses in the vicinity of the site or the linear electrical transmission corridor; therefore, there will be no impact on agriculture.

CUMULATIVE IMPACTS

Cumulative impacts may occur if a project's effects are individually limited, but when combined, they may appear to be more significant. Furthermore, when the proposed project is viewed together with the effects of related projects in the area, cumulative impacts may be significant. A number of projects are envisioned for development in the Potrero PP vicinity that could contribute to cumulative effects.

Immediately north of the Potrero PP site extensive development of port, industrial, and commercial activities is envisioned for Pier 70, an established industrial and port area. Portions of the Pier 70 site that front along Illinois Street are planned for mixed commercial opportunities. There is no specific schedule for the Pier 70 development, although about 650,000 square feet is anticipated to be built in the next five years.

Approximately 1200 feet south of the Potrero PP site, MUNI is developing a transit train storage and maintenance facility. Along Third Street, one block west of the Potrero PP site, MUNI plans to construct a light-rail transit line in the street. This construction will require underground electric line installation as well as in-street surface construction. Development of the MUNI project could coincide with construction of the Potrero PP project.

To the south of the Potrero PP site, the City and County of San Francisco's Illinois Street Rail-Truck Bridge is planned for construction by the end of 2003. This intermodal bridge will improve transportation within the Port's lands, specifically improving access to the Port's North Container Terminal on the north side of Islais Creek Channel.

These and other projects proposed or planned in the vicinity will permanently increase traffic from employees, customers, suppliers, and visitors to the various sites. Construction period impacts will be most significant with regard to traffic disruption from in-street trenching and construction. The underground installation of linear electrical facilities along Illinois Street and along Third Street (the proposed transmission line to Hunters Point and the MUNI underground electrical system, respectively) in an overlapping timeframe could simultaneously disrupt both of these parallel streets, congesting local traffic.

The City and County of San Francisco requests that MUNI and the applicant, coordinate those linear elements of their projects that require excavations in public rights-of-way. Such coordination could include co-location of facilities to minimize costs to both parties and to minimize traffic disruption in the neighborhood.

ENVIRONMENTAL JUSTICE

Staff reviewed the demographic information provided in the **SOCIOECONOMICS** section of this PSA in relation to the locations around the proposed power plant that have the potential to receive a significant land use impact. Land use compatibility issues tend to be localized, generally affecting land uses in close proximity to each other. Since there are no concentrations of minority or low-income populations immediately adjacent to the Potrero PP site (the surrounding area is primarily

industrial), there is little potential for significant adverse land use impacts to such populations. Based on information collected during the course of this analysis from community members and from governmental sources, staff has determined that, with the implementation of mitigation proposed under staff's Proposed Conditions of Certification, there will not be an unmitigated disproportionate impact on a minority or low-income population.

FACILITY CLOSURE

At some point in the future, the project will cease operations and close down. At that time, it will be necessary to ensure that closure occurs in such a way that public health and safety and the environment are protected from adverse impacts.

The planned life of the generation facility is 40 years (AFC pg. 4-1). Economic conditions may lengthen or shorten this time span. When preparing to close the facility, the applicant will submit a Facility Closure Plan to the Energy Commission for review and approval at least twelve months prior to the proposed closure. At the time of closure, all then-applicable LORS will be identified and addressed in the closure plan.

There are two other circumstances under which a facility closure can occur: unexpected temporary closure and unexpected permanent closure. Staff has not identified any LORS from a land use perspective that the applicant would have to comply with in the event of an unexpected temporary or unexpected permanent closure of the project.

MITIGATION

To mitigate the potential for traffic disruption in the Third Street/Illinois Street vicinity during construction of linear facilities in public rights-of-way, staff has proposed **LAND-1** as a condition of approval. This condition would require coordination of planning and, if feasible, co-development of subsurface linear facilities that are required by Potrero PP and MUNI projects.

To preclude conflicts between boring under Islais Creek and the potential footings for the Illinois Street Rail-Truck Bridge proposed across the creek, **LAND-2** has been proposed as a condition. This would require coordination between the City and the project owner to ensure minimal conflicts, if the underground transmission line and the bridge are coincident.

To address questions of improved public access to the Bay and to address mitigation for installation of structures in the Bay, **LAND-3** requires the project owner to meet with BCDC to identify access and fill mitigation strategies that may be appropriate to the site.

CONCLUSIONS AND RECOMMENDATION

CONCLUSIONS

The project will comply with all applicable land use laws, ordinances, regulations and standards (LORS). The proposed building and exhaust stacks will exceed the City's height limitations on structures in the Central Waterfront; however, these are exempt "structures and equipment necessary for the operation of industrial plants" as long as they do not contain separate floors (San Francisco Planning Code Section 260(b)(2)(M)).

The proposed power plant will be compatible with existing and planned land uses because: 1) it is consistent with the current general plan and zoning designations for the property; 2) it is compatible with the heavy industry and port character of the immediately adjacent land uses north and south of the site, and with the commercial character of the land use on Illinois Street; and 3) the project does not abut any zoned residential areas. However, live/work units proposed at the southwest corner of 23rd and Illinois Streets, within the M-2 Heavy Industry zone, would be within approximately 500 feet of the project.

Based on information collected during the course of this analysis, Staff has determined that the proposed Potrero PP Unit 7 project would not result in any unmitigated disproportionate land use impacts to a minority or low-income population.

Staff has concluded that the proposed project has the potential to cause some cumulative impacts in the land use area. Specifically, during the project construction phase, there is a potential for conflict with a planned MUNI project, and the City/County's planned Illinois Street Rail-Truck Bridge. These potential impacts can be mitigated to a level of insignificant through adoption of staff's proposed conditions.

RECOMMENDATION

From the land use perspective, staff recommends that the Commission certify the project and adopt the following conditions of certification, which incorporate staff's proposed mitigation.

CONDITIONS OF CERTIFICATION

LAND-1 The project owner will coordinate installation of underground transmission facilities with MUNI's development of underground facilities for the Third Street Light Rail development, to the extent that this is technically feasible and can be accommodated by the schedule of both projects. To the extent feasible, shared trenches or other co-location strategies shall be pursued so as to minimize disruption to local traffic.

Protocol: At least 30 days prior to the start of construction of the Potrero PP, the project owner shall submit to the Energy Commission's Compliance

Project Manager (CPM) for review minutes of meetings with MUNI and other City officials to verify good faith efforts to co-locate linear electric facilities development. If there is no agreement, the project owner shall provide the CPM a letter report outlining the reasons an agreement was not achieved and detailing the nature of barriers that remain to an agreement.

LAND-2 To avoid location and construction conflicts, the project owner will coordinate with the City regarding the planned transmission line boring under Islais Creek relative to the location of footings or pilings for the City's planned Illinois Street Rail-Truck Bridge in the same vicinity. This Condition applies only if the proposed transmission line route remains under Islais Creek in the vicinity of the proposed bridge.

Protocol: At least 30 days prior to the start of construction of the Potrero PP, the project owner shall submit to the Energy Commission's CPM for review minutes of meetings with City officials and any pertinent drawings or plans to verify coordination of transmission line boring and bridge construction at the Islais Creek crossing.

LAND-3 The owner will meet with the Bay Conservation and Development Commission (BCDC) to determine what opportunities, if any, may exist to establish public access to the Bay shore now or in the future. The owner will also meet with BCDC to establish what mitigation, if any, would be reasonable and appropriate for the installation of intake and discharge structures in the Bay.

Protocol: At least 30 days prior to the start of construction of the Potrero PP, the project owner shall submit to the Energy Commission's CPM for review, minutes of meetings with BCDC officials on 1) ways to provide public access to the water's edge now or in the future, if appropriate, and 2) mitigation requirements for installing intake/discharge facilities in the Bay. Ideas generated in these meetings will be documented and evaluated. Those adopted will be identified, and those not adopted will be identified and the reason for their rejection documented.

REFERENCES

Port of San Francisco. 2000. Waterfront Land Use Plan, January 2000.

San Francisco General Plan, 1996 (as amended).

San Francisco Planning Department. 2000. Southern Waterfront Supplemental Draft Environmental Impact Report, September 2000.

Southern Company (Mirant Corp.). 2000a. Application for Certification for Potrero Power Plant Unit 7 Project, May 2000.

Southern Company (Mirant Corp.). 2000b. Supplemental Information in Response to CEC Data Adequacy Request. August 2000.

NOISE

Jim Buntin

INTRODUCTION

The construction and operation of any power plant creates noise, or unwanted sound. The character and loudness of this noise, the times of day or night during which it is produced, and the proximity of the facility to any sensitive receptors combine to determine whether the facility will meet applicable noise control laws and ordinances, and whether it will exhibit significant adverse environmental impacts.

The purpose of this analysis is to identify and examine the likely noise impacts from the proposed Potrero Power Plant Unit 7 Project (Unit 7), and to recommend procedures to ensure that the resulting noise impacts will comply with applicable laws and ordinances, and will be adequately mitigated. This will enable the Energy Commission to make findings that:

- Unit 7 will likely be built and operated in compliance with all applicable noise laws, ordinances, regulations and standards (LORS); and
- Unit 7 will present no significant adverse noise impacts, or none that have not been mitigated to the extent feasible.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

Under the Occupational Safety and Health Act of 1970 (OSHA) (29 U.S.C. § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 C.F.R. § 1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise level exposure as a function of the amount of time during which the worker is exposed (see **Noise: Appendix A, Table A4** immediately following this section). The regulations further specify a hearing conservation program that involves monitoring the noise to which workers are exposed; assuring that workers are made aware of overexposure to noise; and periodically testing the workers' hearing to detect any degradation.

There are no federal laws governing offsite (community) noise.

STATE

California Government Code Section 65302(f) requires that a noise element be prepared as part of the general plan to address foreseeable noise problems. In addition, Title 4, California Code of Regulations has guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. The State land use compatibility guidelines are listed in NOISE: Table 1.

LAND USE CATEGORY		COMMUNITY NOISE EXPOSURE - Ldn or CNEL (dB)																					
		50			55			60			65			70			75			80			
Residential - Low Density Single Family, Duplex, Mobile Home																							
Residential - Multi-Family																							
Transient Lodging - Motel, Hotel																							
Schools, Libraries, Churches, Hospitals, Nursing Homes																							
Auditorium, Concert Hall, Amphitheaters																							
Sports Arena, Outdoor Spectator Sports																							
Playgrounds, Neighborhood Parks																							
Golf Courses, Riding Stables, Water Recreation, Cemeteries																							
Office Buildings, Business Commercial and Professional																							
Industrial, Manufacturing, Utilities, Agriculture																							

	Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design.
	Normally Unacceptable	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.
	Clearly Unacceptable	New construction or development generally should not be undertaken.

May 31, 2001

Other State LORS include the California Environmental Quality Act (CEQA) and California Occupational Safety and Health Administration (Cal-OSHA) regulations.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA requires that significant environmental impacts be identified, and that such impacts be eliminated or mitigated to the extent feasible. The CEQA Guidelines (Cal. Code of Regulations, Title 14, § 15000 et seq., Appendix G, § XI) explain that a significant effect from noise may exist if a project would result in:

- “a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- “b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
- “c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- “d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project....”

CAL-OSHA

Cal-OSHA has promulgated Occupational Noise Exposure Regulations (Cal. Code Regs., tit. 8, §§ 5095-5099) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards described above.

LOCAL

CITY AND COUNTY OF SAN FRANCISCO GENERAL PLAN NOISE STANDARDS

The Noise Element of the City and County of San Francisco General Plan pertains only to transportation-related noise, so there are no specific provisions in the General Plan addressing noise due to fixed sources such as the Unit 7.

CITY AND COUNTY OF SAN FRANCISCO NOISE ORDINANCES

The City and County of San Francisco has adopted a Noise Ordinance that regulates fixed noise sources and construction. Section 2909 of the San Francisco Municipal Code regulates noise from fixed sources, and is enforced by the Director of Public Health. The basic noise level criteria for most residential land uses (zoned R-1-D, R-1 and R-2) are that the average noise level caused by the source shall not exceed 50 dBA at nighttime (10 p.m. to 7 a.m.), or 55 dBA in daytime (7 a.m. to 10 p.m.), measured at the affected property line. The noise standard for industrial-zoned land (M-1) is 70 dBA anytime. In the absence of specific noise standards, Section 2901.11 states that producing a noise level that exceeds the ambient noise level by 5 dBA or more when measured at the receiving property line is a violation of the Code.

Sections 2907 and 2908 of the San Francisco Municipal Code regulate noise from construction sources, and are enforced by the Director of Public Works. The basic requirement for individual articles of construction equipment is that the noise level shall not exceed 80 dBA at a distance of 100 feet, except for impact tools and equipment such as jackhammers and pile drivers, and except for helicopters used in construction.

Nighttime construction is limited by Section 2908. It states that it is unlawful, between the hours of 8 p.m. and 7 a.m., to erect, construct, demolish, excavate for, alter or repair any building or structure if the noise level thereby created exceeds the ambient noise level by 5 dBA or more. Exceptions may be granted by the Director of Public Works in the form of a special permit prescribing such conditions, working times, equipment types and noise standards as deemed to be required in the public interest.

SETTING

PROJECT BACKGROUND

The Unit 7 Project involves the construction and operation of a new 530 MW natural gas-fired, combined-cycle power plant, located in the City and County of San Francisco. The new unit will include two natural gas fired General Electric Frame 7FA combustion turbine generators (CTGs), one steam turbine generator and associated equipment. It will also include two supplementally fired heat recovery steam generators (HRSGs). Step up transformers, power transmission system, control buildings, storage tanks and other ancillary equipment will complete the facility.

EXISTING LAND USE

The existing Potrero Power Plant is located in a waterfront industrial area, and is immediately surrounded by industrial uses to the south, west and north. The San Francisco Bay is at the east project boundary. The new Unit 7 will be an addition to the site's existing Units 3, 4, 5 and 6.

The City and County of San Francisco regulates land use planning for the Potrero Power Plant site.

CITY/COUNTY ZONING AND GENERAL PLAN DESIGNATION

The Potrero Power Plant site, zoned for Heavy Industry, is authorized under the City and County of San Francisco General Plan land use designation as HI (Heavy Industry) (SECAL 2000a, AFC Figure 8.4.2).

SENSITIVE RECEPTORS

The nearest sensitive receptors are multi-family residences located nearby at Third Street near 22nd Street, 22nd Street west of Third Street, and in the Potrero Hill neighborhood west of Interstate 280. With the exception of the Potrero Hill

neighborhood, multi-story industrial buildings block line of sight to the facility from the residences.

EXISTING NOISE LEVELS

In order to predict the likely noise effects of the Unit 7 on these sensitive receptors, the Applicant commissioned an ambient noise survey of the area. This survey was performed using Larson Davis Model 712 integrating sound level meters, which recorded L_{eq} , L_{10} , L_{50} , and L_{90} noise measurements (SECAL 2000a, AFC § 8.5.1.1). The L_{dn} and CNEL were calculated by staff from the hourly L_{eq} data.¹

The Applicant's noise survey monitored noise levels at the nearest residence with a direct line of sight to the plant, which is located about 1,200 feet from the proposed facility (Site ML1). Noise measurements were recorded hourly for a 25-hour period from 9:00 a.m. on October 11, 1999 until 10:00 a.m. October 12, 1999.

In addition to noise measurements at the nearest affected residence, noise measurements were recorded at three other locations (Sites ML2, ML3 and ML4) for a one-hour period during the daytime, evening and nighttime periods to further characterize the existing noise levels in the vicinity of the site. The noise levels in those time periods were measured at all three sites on August 18 and 19, 1999, and at two sites on October 11 and 12, 1999.

Survey results indicated that the ambient noise level for the most affected residential receptor is primarily affected by vehicular traffic. The average noise levels over the 25-hour period were 64.9 dBA L_{eq} , 68.2 dB L_{dn} , 55.9 dBA L_{90} , and 68.5 dB CNEL. The average noise levels at the three short-term noise measurement sites were in the range of 60 to 65 dBA L_{eq} at ML2, 54 to 62 dBA L_{eq} at ML3, and 50 to 59 dBA L_{eq} at ML4. The existing power plant was noted to be audible at ML2, which is located near the project boundary. The apparent power plant noise level there was about 47 dBA. (Unit 7 2000, AFC Tables 8.5.1, 8.5.2, and 8.5.3).

IMPACTS

Project noise impacts can be created by construction and by normal operation of the power plant.

PROJECT SPECIFIC IMPACTS — CONSTRUCTION

COMMUNITY EFFECTS

Construction noise is a temporary phenomenon; the construction period for the Unit 7 facility is scheduled to last 24 months (SECAL 2000a, AFC § 2.2.14.3).

Construction of an industrial facility such as a power plant is typically and unavoidably noisier than what is usually permissible under noise ordinances regulating fixed sources. In order to allow the construction of new facilities,

¹ For definitions of these and other technical terms, please refer to NOISE: APPENDIX A, immediately following this section.

construction noise during certain hours is commonly exempt from enforcement by local ordinances. Refer to the aforementioned section on LORS associated with the City and County of San Francisco.

The Applicant has predicted the noise impacts of project construction at the nearest sensitive receptors. When construction activities occur, resulting noise levels at the nearest residence are projected to be less than 50 dBA. Average ambient noise levels there were reported to be in the range of 50 to 59 dBA. Therefore, construction related noise levels would be considered minor and will not result in any noise impacts (SECAL 2000a, AFC § 8.5-5).

STEAM BLOWS

Typically, the steam blows create the loudest noise encountered during construction, and are inherent in building any project incorporating a steam turbine. After erection and assembly of the feedwater and steam systems, the piping and tubing that comprises the steam path has accumulated dirt, rust, scale and construction debris such as weld spatter, dropped welding rods and the like. If the plant were started up without thoroughly cleaning out these systems, all this debris would find its way into the steam turbine, quickly destroying the machine.

In order to prevent this, before the steam system is connected to the turbine, the steam line is temporarily routed to the atmosphere. High-pressure steam is then raised in the heat recovery steam generator (HRSG) or a temporary boiler and allowed to escape to the atmosphere through the steam piping. This flushing action, referred to as a steam blow, is quite effective at cleaning out the steam system. A series of short steam blows, lasting two or three minutes each, is performed several times daily over a period of two or three weeks. At the end of this procedure, the steam line is connected to the steam turbine, which is then ready for operation.

These steam blows can produce noise as loud as 130 dBA at a distance of 100 feet. This would attenuate to approximately 108 dBA, an exceedingly disturbing level, at the nearest residence, 1,200 feet distant. In order to minimize disturbance from steam blows, the steam blow piping can be equipped with a silencer that will reduce noise levels by 20 to 30 dBA, or to a level of 78 to 88 dBA at the nearest residence. This is still an annoying noise level; staff proposes that any high pressure steam blows be muffled with an appropriate silencer, and be performed only during restricted daytime hours (see proposed Condition of Certification **NOISE-4** below) in order to minimize annoyance to residents.

Alternatively, the Applicant may elect to employ a new, quieter steam blow process, variously referred to as QuietBlow™ or Silentsteam™. This method utilizes lower pressure steam over a continuous period of approximately 36 hours. Resulting noise levels reach only about 80 dBA at 100 feet; noise levels at the nearest residence would thus be about 58 dBA, in the range of the background noise levels.

Regardless of which steam blow process the Applicant chooses, staff proposes a notification process (see proposed Condition of Certification **NOISE-5** below) to

make neighbors aware of impending steam blows. This should help ensure the process is at least tolerable to residents.

LINEAR FACILITIES

The interconnection between the Potrero switchyard and PG&E's Hunters Point Substation will consist of two 115 kV circuits, composed of 3-phase cables that will be installed in twin parallel underground conduits. After leaving the Potrero switchyard, the underground cables will be routed under city streets between the two substations. The preferred routing lies primarily within Illinois Street-Cargo Way.

Construction of the transmission cables will produce noise. This noise will be noticeable, and possibly annoying, to persons outside their homes at those residences nearest the construction area. This work, however, is only a temporary phenomenon; the work will progress at such a pace that no single receptor will be inconvenienced for more than a few days. In addition, such work is customarily performed during the daytime, and would cause no impacts at night, when quiet time is most important. Applicable LORS (i.e., City and County of San Francisco Municipal Code Sections 2907 and 2908) regarding daytime and nighttime construction limit noisy construction hours and noise levels.

Transmission line construction will be adjacent to industrial and commercial land uses. Staff believes no significant adverse noise impacts are likely to occur due to the construction of the linear facilities.

WORKER EFFECTS

The Applicant acknowledges the need to protect construction workers from noise hazards as well as the existence of applicable LORS relating to worker health and safety. In order to comply with any applicable LORS, the project owner will conduct an occupational noise evaluation that will identify the activity, associated noise levels, and the type(s) of administrative and engineering controls to serve as mitigation. Measures to be implemented for noise-related impacts may include a Hearing Conservation Program and a Personal Protective Equipment Program.

To ensure adequate protection of workers, staff proposes a Condition of Certification (see Condition of Certification **NOISE-3**).

PROJECT SPECIFIC IMPACTS — OPERATION

COMMUNITY EFFECTS

The Applicant commits to incorporating noise mitigation measures into the design of the project that will ensure that noise levels at the nearest receptor (about 1,200 feet in distance) will be below the 50 dBA standard established by the City and County of San Francisco. The noise impact calculations in the AFC indicate that the normal operating noise level from the proposed power plant would be approximately 55 dB CNEL at the closest residential receptor, which is well below the ambient survey level of 68.5 dB CNEL.

POWER PLANT OPERATION

During its operating life, Unit 7 will represent essentially a steady, continuous noise source day and night. Occasional short-term increases in noise level will occur as steam relief valves open to vent pressure, or during startup or shutdown as the plant transitions to and from steady-state operation. At other times, such as when the plant is shut down for lack of dispatch or for maintenance, noise levels will decrease.

The primary noise sources anticipated from the proposed facility include the heat recovery steam generators, the combustion turbine generator packages, and the steam turbine generator. The noise emitted by power plants during normal operations is generally broadband, steady state in nature.

The Energy Commission defines the area impacted by the proposed project as that area where there is a potential increase in existing noise levels of 5 dBA or more during operation of the project. Typically, the Energy Commission requires that the 5 dBA change be compared against the lowest one-hour L_{90} (background) values, which usually occur during nighttime hours where sleep interference is an issue. According to Table 8.5-2 of the Applicant's AFC, the lowest L_{90} noise level of 47.4 dBA occurred at ML1 between the hours of 3:00 a.m. and 4:00 a.m.

The operating noise level from the proposed power plant would be approximately 49 dBA at the nearest existing sensitive receiver, which is 1.6 dB higher than the ambient L_{90} noise level in the quietest hour of the 24-hour day, and 2 dB lower than the average L_{90} value during nighttime hours. This noise level would be below the significance criterion. As a result, the noise levels associated with the proposed project would not cause any significant noise impacts on the residential community. It should be noted that the proposed Condition of Certification **NOISE-6** would require that the project noise levels at the closest residential receptor would not be any greater than the specified noise level standard of 50 dBA. This is less than 3 dB higher than the noise level during the quietest hour of the 24-hour day.

The City and County of San Francisco is currently processing an application to develop 155 live/work units at 1300 Illinois Street, which is on the corner of 23rd Street diagonally opposite the project site. These units would include both residential and commercial uses, much closer to the power plant than any other noise sensitive land uses. The power plant has the potential to produce noise levels that would exceed the residential standards of the San Francisco noise ordinance at that location. According to the applicant, the predicted power plant noise level at 1300 Illinois Street is 60 dBA. Assuming an ambient noise level of about 54 dBA, the cumulative noise level would be 61 dBA. This is an increase of about 7 dBA.

The zoning at 1300 Illinois Street is currently M-2, in which the permitted sound level at any time of the day or night is 75 dBA. Therefore the project noise level would be in compliance with the City Municipal Code. If the City were to approve a change in zoning for this property from M-2 to a residential zone, the power plant noise level would exceed the noise standards of the Municipal Code, and mitigation

would be required. However, the assignment of responsibility for providing the mitigation is not clear.

TONAL AND INTERMITTENT NOISES

One possible source of annoyance would be strong tonal noises, individual sounds that, while not louder than permissible levels, stand out in sound quality. To ensure the avoidance of such tonal sound, the noise control design of Unit 7 can be balanced to bring as many noise sources as possible to the same relative sound level, causing them all to blend without any one source standing out. Another potentially annoying source of noise from a combined cycle power plant is the intermittent or occasional actuation of steam relief valves. The hissing noise from these valves can be largely mitigated by the installation of adequate mufflers. To ensure that adequate measures are taken to mitigate tonal and intermittent noise sources, staff has proposed measures (see proposed Condition of Certification **NOISE-6**, below) to ensure that tonal and intermittent steam relief noises are not allowed to cause a problem.

LINEAR FACILITIES

The linear facilities associated with the proposed Unit 7 facility are transmission lines within city streets. The lines would be buried below ground and would not produce any audible noise. Thus, there will be no noise impacts associated with the transmission lines.

Noise sources associated with power transmission include occasional breaker operations in the switchyard, and corona noise and very low magnetostriction hum from the conductors. Breaker noise is considered impulsive in nature, lasting a very short duration, and may occur only a very few times per year. Corona noise is characterized as a buzz or hum and is usually worse when the conductors are wet, such as in rain or fog. No significant noise impact will occur because the new transmission line would not be located near sensitive receptors (SECAL 2000a, AFC § 5.2).

Worker Effects

The Applicant recognizes the need to protect plant operating and maintenance personnel from noise hazards, and commits to comply with applicable LORS, beginning with an occupational noise evaluation after the project has been constructed.

With proper execution of the Hearing Conservation Program, as well as with the implementation of proposed Condition of Certification **NOISE-7**, no occupational safety impacts are anticipated from operational noise.

CUMULATIVE IMPACTS

The *CEQA Guidelines*, Title 14, California Code of Regulations, Section 15130, requires a discussion of cumulative environmental impacts to determine whether the project's incremental effect is cumulatively considerable. Cumulative impacts are defined as those impacts that are created because of the combination of the project

evaluated together with other projects causing related impacts. The *CEQA Guidelines* require that the discussion reflect the severity of the impacts and the likelihood of their occurrence, but need not provide as much detail as the discussion of the impacts attributable to the proposed project alone.

The *CEQA Guidelines* provide that an analysis may summarize growth projections in an adopted general plan or in a prior certified environmental document. Alternatively, one may compile a list of past, present, and probable future projects producing related or cumulative impacts. The second method has been utilized for the purposes of this Staff Assessment.

The City and County of San Francisco has zoned the project area for heavy and light industrial uses. The area is currently well developed with industrial land uses, and it is not known whether any other major construction projects are planned for the area. The Unit 7 facility would be consistent with the City's plans and management policies regarding land use. In addition, it is assumed that the cumulative noise level associated with constructing this project would not significantly increase the ambient noise level in the area, especially in view of the existing industrial land uses and the nearby freeway. As a result, there are no significant cumulative effects associated with construction the Unit 7 Project (SECAL 2000a, AFC Figure 8.4-2).

FACILITY CLOSURE

Upon closure of the facility, all operational noise will cease; no further adverse impacts from operation will be possible. The remaining potential noise source will be that caused by the dismantling of the structures and equipment, and any site restoration work that may be performed. Since this noise will be similar to that caused by the original construction of the Unit 7 Project, it can be treated similarly. That is, noisy work can be performed during daytime hours, with machinery and equipment properly equipped with mufflers. Any noise LORS then in existence would apply; applicable Conditions of Certification included in the Energy Commission Decision would also apply unless properly modified.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff concludes that Unit 7 will likely be built and operated to comply with all applicable noise laws, ordinances, regulations and standards. Staff further concludes that the Unit 7 facility, mitigated as described above, will likely present no significant adverse noise impacts. Unit 7 will likely represent an unobtrusive, nearly undetectable component of ambient noise levels.

RECOMMENDATIONS

Staff recommends that the following proposed Conditions of Certification be adopted to ensure compliance with all applicable noise LORS and implementation of the Applicant's proposed mitigation measures.

PROPOSED CONDITIONS OF CERTIFICATION

NOISE-1 Prior to the start of project-related ground disturbing activities, the project owner shall notify all residents and business owners within one-half mile of the site or adjacent to the transmission line route, by mail or other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

Verification: At least 15 days prior to the start of project-related ground disturbing activities, the project owner shall transmit to the Energy Commission Compliance Project Manager (CPM) a statement, signed by the project manager, attesting that the above notification has been performed, and describing the method of that notification. If the notification is written, the statement shall include a copy of the notification. This statement shall also attest that the telephone number has been established and posted at the site. The telephone number shall be included in the statement.

NOISE-2 Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all project-related noise complaints.

Protocol: The project owner or authorized agent shall:

- use the Noise Complaint Resolution Form (see Exhibit 1 for example), or functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;
- attempt to contact the person(s) making the noise complaint within 24 hours;
- conduct an investigation to determine the source of noise related to the complaint;
- if the noise is project related, take all feasible measures to reduce the noise at its source; and

- submit a report documenting the complaint and the actions taken. The report shall include: a complaint summary, including final results of noise reduction efforts; and if obtainable, a signed statement by the complainant stating that the noise problem is resolved to the complainant's satisfaction.

Verification: Within 30 days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form, or similar instrument approved by the CPM, with the City and County of San Francisco Department of Environmental Health, and with the CPM, documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a 30-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is finally implemented.

NOISE-3 Prior to the start of project-related ground disturbing activities, the project owner shall submit to the CPM for review a noise control program. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA and Cal-OSHA standards.

Verification: At least 30 days prior to the start of project-related ground disturbing activities, the project owner shall submit to the CPM the above referenced program. The project owner shall make the program available to OSHA upon request.

NOISE-4 If a traditional, high-pressure steam blow process is employed, the project owner shall equip steam blow piping with a temporary silencer that quiets the noise of steam blows to no greater than 110 dBA measured at a distance of 100 feet. The project owner shall conduct steam blows only during the hours of 8 a.m. to 5 p.m., unless the CPM agrees to longer hours based on a demonstration by the project owner that offsite noise impacts will not cause annoyance. If a low-pressure continuous steam blow process is employed, the project owner shall submit a description of this process, with expected noise levels and projected hours of execution, to the CPM.

Verification: At least 15 days prior to the first high-pressure steam blow, the project owner shall submit to the CPM drawings or other information describing the temporary steam blow silencer and the noise levels expected, and a description of the steam blow schedule. At least 15 days prior to any low-pressure continuous steam blow, the project owner shall submit to the CPM drawings or other information describing the process, including the noise levels expected and the projected time schedule for execution of the process.

NOISE-5 If high pressure steam blows are used, the project owner shall notify all residents or business owners within one mile of the site of the planned steam blow activity, and shall make the notification available to other area residents

in an appropriate manner. The notification may be in the form of letters to the area residences, telephone calls, fliers or other effective means. The notification shall include a description of the purpose and nature of the steam blow(s), the proposed schedule, the expected sound levels, and the explanation that it is a one-time operation and not a part of normal plant operations.

Verification: At least 15 days prior to the first steam blow(s), the project owner shall notify the above entities, and, within five days of notifying these entities, the project owner shall send a letter to the CPM confirming that they have been notified of the planned steam blow activities, including a description of the method(s) of that notification.

NOISE-6 After the project first achieves an output of 80 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey, utilizing the same monitoring site employed in the pre-project ambient noise survey as a minimum. The survey shall also include the octave band pressure levels to ensure that no new pure-tone noise components have been introduced. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints. Steam relief valves shall be adequately muffled to preclude noise that draws legitimate complaints. If the results from the survey indicate that the project noise levels at the closest sensitive receptor are in excess of 50 dBA averaged in any 1-hour period, additional mitigation measures shall be implemented to reduce noise to a level of compliance with this limit.

Verification: Within 30 days after the project first achieves an output of 80 percent or greater of rated capacity, the project owner shall submit a summary report of the survey to the City and County of San Francisco Department of Environmental Health, and to the CPM. Included in the report shall be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures. If additional mitigation measures are necessary within 30 days of completion of installation of these measures, the project owner shall submit to the CPM a summary report of a new noise survey, performed as described above and showing compliance with this condition.

NOISE-7 The project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey shall be conducted within 30 days after the facility is in full operation, and shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations, sections 5095-5099 (Article 105) and Title 29, Code of Federal Regulations, section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure. The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and federal regulations.

Verification: Within 30 days after completing the survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to OSHA and Cal-OSHA upon request.

NOISE-8 Noisy construction work (that which causes offsite annoyance, as evidenced by the filing of a legitimate noise complaint) shall be restricted to the times of day delineated below:

High-pressure steam blows:	8 a.m. to 5 p.m.
Other noisy work	7 a.m. to 8 p.m., according to City and County of San Francisco Municipal Code Section 2908.

Verification: The project owner shall transmit to the CPM in the first Monthly Construction Report a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM

Potrero Power Plant Unit 7
(00-AFC-4)

NOISE COMPLAINT LOG NUMBER _____

Complainant's name and address:

Phone number: _____

Date complaint received: _____

Time complaint received: _____

Nature of noise complaint:

Definition of problem after investigation by plant personnel:

Date complainant first contacted: _____

Initial noise levels at 3 feet from noise source _____ dBA Date: _____

Initial noise levels at complainant's property: _____ dBA Date: _____

Final noise levels at 3 feet from noise source: _____ dBA Date: _____

Final noise levels at complainant's property: _____ dBA Date: _____

Description of corrective measures taken:

Complainant's signature: _____ Date: _____

Approximate installed cost of corrective measures: \$ _____

Date installation completed: _____

Date first letter sent to complainant: _____ (copy attached)

Date final letter sent to complainant: _____ (copy attached)

This information is certified to be correct:

Plant Manager's Signature: _____

REFERENCES

- Barnes, J.D., L.N. Miller, and E.W. Wood. 1976. Prediction of Noise from Power Plant Construction. Bolt Beranek and Newman, Inc., Cambridge, Massachusetts. Prepared for Empire State Electric Energy Research Corporation, Schenectady, New York.
- Beranek, L.L., I.L. Ver. 1992. *Noise and Vibration Control Engineering: Principles and Applications*. John Wiley and Sons, August.
- Cunniff, Patrick F., *Environmental Noise Pollution*. John Wiley & Sons, 1992.
- DHS (California Department of Health Services), Office of Noise Control. *Model Community Noise Control Ordinance*, 1977.
- Edison Electric Institute. *Electric Power Plant Environmental Noise Guide*, 1984.
- Transportation Noise Section of the Environmental Protection Element of the City and County of San Francisco General Plan, I.6.11 *et seq*, 1974.
- San Francisco Municipal Code, Article 29, Sections 2900-2918, 1972.
- Kryter, Karl D. *The Effects of Noise on Man*. Academic Press, N.Y., 1970.
- Office of Planning and Research. 1990. State of California General Plan Guidelines. June.
- Miller, L.N., E.W. Wood, R.M. Hoover, A.R. Thompson, and S.L. Paterson. 1978. Electric Power Plant Environmental Noise Guide, Volume 1. Bolt Beranek and Newman, Inc., Cambridge, Massachusetts. Prepared for Edison Electric Institute, New York, New York.
- Peterson and Gross (Peterson, Arnold P. G. and Ervin E. Gross, Jr.). *Handbook of Noise Measurement*, 7th ed. GenRad, Concord, MA., 1974.
- SECAL (Southern Energy California). 2000 a. Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, May 31.
- Smith, B.J., R.J. Peters, S. Owens. 1996. *Acoustics and Noise Control*, 2nd Edition. Addison-Wesley. November
- U.S. EPA. 1971. *Noise from Construction Equipment and Operations*. Prepared by Bolt et al. Beranek, and Newman, Boston, MA. December
- U.S. EPA. 1971. *Community Noise*. Washington D.C., December

U.S. EPA. 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. 550/9-74-004. U.S. Environmental Protection Agency, Office of Noise Abatement and Control. Washington, DC.

U.S. EPA . 1978. *Protective Noise Levels, (Condensed Version of EPA Level Document)* (No. PB82-138827).

NOISE: APPENDIX A

FUNDAMENTAL CONCEPTS OF COMMUNITY NOISE

To describe noise environments and to assess impacts on noise sensitive area, a frequency weighting measure that simulates human perception is customarily used. It has been found that A-weighting of sound pressure levels best reflects the human ear's reduced sensitivity to low frequencies, and correlates well with human perceptions of the annoying aspects of noise. A-weighted sound pressure levels, or sound levels, in decibels (dB), often denoted as dBA, are cited in most noise criteria. Decibels are logarithmic units that conveniently compare the wide range of sound pressure levels to which the human ear is sensitive. Table A1 provides a description of technical terms related to noise.

Noise environments and consequences for human activities are usually well represented by an equivalent A-weighted sound level over a given time period (L_{eq}), or by average day and night levels with a nighttime weighting of 10 dB (L_{dn}). Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45-to 60 dBA range, and high above 60 dBA. Outdoor day-night sound levels vary over a range of 50 dB depending on the specific type of land use. In wilderness areas, the L_{dn} noise levels average approximately 35 dB, 50 dB in small towns or wooded residential areas, 65 to 75 dB in major metropolis downtown (e.g., Los Angeles), and 80 to 85 dB very near freeways and airports. Although people often accept the higher noise levels associated with very noisy urban residential and residential-commercial zones, they nevertheless are considered to be levels of noise adverse to public health.

Various environments can be characterized by noise levels that are generally considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than would be expected for commercial or industrial zones. Nighttime ambient noise levels in urban environments are about seven decibels lower than the corresponding average daytime levels. The day-to-night difference in rural areas away from roads and other human activity can be considerably less. Areas with full-time human occupation that are subject to nighttime noise, which does not decrease relative to daytime levels, are often considered objectionable. Noise levels above 45 dBA at night can result in the onset of sleep interference effects (USEPA, 1971). At 70 dBA, sleep interference effects become considerable.

In order to help the reader understand the concept of noise measured in decibels (dBA), NOISE: Table A2 has been provided to illustrate common noises and their associated A-weighted sound pressure levels.

NOISE: Table A1
Definition of Some Technical Terms Related to Noise

Terms	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dB	The sound pressure level in decibels as measured on a Sound Level Meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear, and correlates well with subjective reactions to noise. All sound pressure levels in this testimony are A-weighted.
L10, L50, & L90	The A-weighted sound levels that are exceeded 10%, 50%, and 90% of the time, respectively, during the measurement period. L90 is generally taken as the background noise level.
Equivalent Noise Level L_{eq}	The energy average A-weighted sound pressure level during the noise level measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted sound pressure level during a 24-hour day, obtained after addition of 4.8 decibels to sound levels in the evening from 7 p.m. to 10 p.m., and after addition of 10 decibels to sound levels in the night between 10 p.m. and 7 a.m.
Day-Night Level, L_{dn}	The average A-Weighted sound pressure level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10 p.m. and 7 a.m.
Ambient Noise Level	The composite of noise from all sources, near and far. The normal or existing level of environmental noise at a given location.
Intrusive Noise	That noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content, as well as the prevailing ambient noise level.
Source: California Department of Health Services 1976.	

NOISE: Table A2 Typical Environmental and Industry Sound Levels			
Source and Given Distance from that Source	A-Weighted Sound Level in Decibels (dBA)	Environmental Noise	Subjective Impression
Civil Defense Siren (100')	140-130		Pain Threshold
Jet Takeoff (200')	120		
Very Loud Music	110	Rock Music Concert	Very Loud
Pile Driver (50')	100		Very Loud
Ambulance Siren (100')	90	Boiler Room	Very Loud
Freight Cars (50')	85		
Pneumatic Drill (50')	80	Printing Press Kitchen with Garbage Disposal Running	Loud
Freeway (100')	70		Moderately Loud
Vacuum Cleaner (100')	60	Data Processing Center Department Store/Office	
Light Traffic (100')	50	Private Business Office	Quiet
Large Transformer (200')	40		
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing
Source: Peterson and Gross 1974			

Subjective Response to Noise

The adverse effects of noise on people can be classified into three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction.
- Interference with activities such as speech, sleep, and learning.
- Physiological effects such as anxiety or hearing loss.

The sound levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Workers in industrial plants can experience noise effects in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction, primarily because of the wide variation in individual tolerance of noise.

One way to determine a person's subjective reaction to a new noise is to compare the level of the existing (background) noise, to which one has become accustomed, with the level of the new noise. In general, the more the level or the tonal variations

of a new noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.

With regard to increases in A-weighted noise levels, knowledge of the following relationships (Kryter 1970) can be helpful in understanding the significance of human exposure to noise.

1. Except under special conditions, a change in sound level of one dB cannot be perceived.
2. Outside of the laboratory, a 3-dB change is considered a barely noticeable difference.
3. A change in level of at least five dB is required before any noticeable change in community response would be expected.
4. A 10-dB change is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response.

Combination of Sound Levels

People perceive both the level and frequency of sound in a non-linear way. A doubling of sound energy (for instance, from two identical automobiles passing simultaneously) creates a three dB increase (i.e., the resultant sound level is the sound level from a single passing automobile plus three dB). The rules for decibel addition used in community noise prediction are:

NOISE: Table A3	
Addition of Decibel Values	
When two decibel values differ by:	Add the following amount to the larger value
0 to 1 dB	3 dB
2 to 3 dB	2 dB
4 to 9 dB	1 dB
10 dB or more	0
Figures in this table are accurate to ± 1 dB.	

Source: Thumann, Table 2.3

Sound and Distance

- Doubling the distance from a noise source reduces the sound pressure level by 6 dB.
- Increasing the distance from a noise source ten times reduces the sound pressure level by 20 dB.

Worker Protection

OSHA noise regulations are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time to which the worker is exposed:

NOISE: Table A4
OSHA Worker Noise Exposure Standards

Duration of Noise (Hrs/day)	A-Weighted Noise Level (dBA)
8.0	90
6.0	92
4.0	95
3.0	97
2.0	100
1.5	102
1.0	105
0.5	110
0.25	115

Source: OSHA Regulation

PUBLIC HEALTH

Obed Odoemelum, Ph.D.

INTRODUCTION

Operating the proposed Unit 7 addition to the Potrero Power Plant (or Potrero PP) would produce combustion products and possibly expose the general public and workers to these pollutants as well as the toxic chemicals associated with other aspects of facility operations. The purpose of this public health analysis is to determine whether or not a significant health risk would result from public exposure to these chemicals and combustion by-products as routinely emitted during project operations. The issue of possible worker exposure is addressed in the **Worker Safety and Fire Protection** section of this Preliminary Staff Assessment (PSA) while the health significance of exposure to the project-related electric and magnetic fields (EMF) is addressed in the **Transmission Line Safety and Nuisance** section.

The pollutants of primary concern in this analysis are those for which no air quality standards have been established. These are known as non-criteria pollutants, toxic air pollutants, or air toxics. Most of them are emitted together as volatile organic compounds (VOCs). The rest are emitted as toxic metals. Those pollutants for which ambient air quality standards have been established are known as criteria pollutants and are emitted in much larger amounts from common sources. A project's ability to comply with these air quality standards is assessed in the **Air Quality** section. When any project is proposed for an area in violation of any of these standards, mitigation might be necessary to prevent further additions to the existing levels. Since this Unit 7 project is proposed for an area with existing violations of specific air quality standards as noted in the **Air Quality** section, such mitigation is recommended in that section.

The criteria pollutants are identified in this section (along with regulations for their control) because they usually contribute significantly to the total pollutant exposure in any given area. Furthermore, the same control technologies may be effective for controlling both types of pollutants when emitted from the same source. Compliance with the required control technologies is discussed in the **Air Quality** section for the proposed Unit 7 project.

LAWS ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

THE CLEAN AIR ACT OF 1970 (42 U.S.C., SECTION 7401 ET SEQ.)

This section of the act required establishment of ambient air quality standards to protect the public from the effects of air pollutants. These standards have been established by the United States Environmental Protection Agency (EPA) for the major criteria pollutants: nitrogen oxides (NO_x), ozone, sulfur dioxide, carbon monoxide, sulfates, lead, and particulate matter with a diameter of 10 micron or less (PM₁₀).

STATE

CALIFORNIA HEALTH AND SAFETY CODE SECTION 39606

This section of the code requires the California Air Resources Board (ARB) to establish California's ambient air quality standards to reflect the California-specific conditions influencing its air quality. Such standards have been established by the ARB for ozone, carbon monoxide, sulfur dioxide, PM10, lead, hydrogen sulfide, vinyl chloride and nitrogen dioxide. The California standards are listed together with the corresponding federal standards in the **Air Quality** section.

CALIFORNIA HEALTH AND SAFETY CODE SECTION 41700

This section of the code states that "No person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause or have a natural tendency to cause injury or damage business or property.

THE CALIFORNIA HEALTH AND SAFETY CODE SECTION 39650 ET SEQ.

This section of the code mandates that the California Environmental Protection Agency (Cal-EPA) establish safe exposure limits for toxic, non-criteria air pollutants and identify the best available methods for controlling their emission. These laws also require that the new source review rules for each air quality management district (AQMD or air district) include regulations establishing procedures to control the emission of these pollutants. The toxic emissions from natural gas combustion are listed in ARB's Toxic Emissions Factors (CATEF) database for natural gas-fired combustion turbines to allow for uniform assessment as emitted from all combustion sources in the state. Cal-EPA has developed specific cancer potency estimates for assessing any cancer risk they may pose at specific exposure levels. For toxic air pollutants that do not cause cancer, Cal-EPA established specific no-effects levels (known as reference exposure levels or RELs) for assessing the likelihood of producing health effects at specific exposure levels. Such health effects would be considered significant only when exposure exceeds these reference levels. The Energy Commission staff (staff) uses these Cal-EPA potency estimates and reference exposure values in its health risk analyses.

HEALTH AND SAFETY CODE SECTION 44300 ET SEQ.

This section of the code requires facilities, which emit large quantities of criteria pollutants and any amount of non-criteria pollutants to provide the local air district an inventory of toxic emissions. Operators of such facilities may also be required to prepare a quantitative health risk assessment to address the potential health risks involved. The ARB ensures statewide implementation of these requirements through the state's air districts.

LOCAL

Local implementation of provisions of the Health and Safety Code section 44300 in the project area is ensured by the area's air district, the Bay Area Air Quality

Management District (BAAQMD). Unit 7 has complied with the related requirements.

BAAQMD Regulation 1, Section 301, "Public Nuisance" (Amended 10/98). Requirements of this regulation allow for compliance with the requirements of the Health and Safety Code, section 41700.

SETTING

POTENTIALLY AFFECTED AREA

As discussed by the applicant, Mirant Corporation, or Mirant (2000a, pages 2-1,8.1-2 and 8.8-6 through 8.8-12), the proposed Unit 7 project will be constructed (as a part of the existing Potrero Power Plant) on a 6.5-acre portion of the 20 acres, which the Potrero Power Plant presently occupies. This location is on the eastern side of the City of San Francisco along the western shore of San Francisco Bay. Nearby cities in this urban area include South San Francisco and Daly City to the south and Alameda and Oakland across the Bay to the north. The site is surrounded by industrial and commercial uses to the north, west, and south, with San Francisco Bay on the east. There are a few scattered residences among these establishments, especially along Third Street. Businesses in this area include shipping piers and dry dock facilities along the waterfront, vehicle storage and impoundment yards to the north, gas stations, warehouses, factories and small commercial establishments to the west, and railroad yard and trucking companies to the south. The closest housing development is approximately 500 feet from the site, west of Third Street. From this point, the population increases in density to the west for about $\frac{3}{4}$ mile, centered in the Potrero Hill neighborhood. Other neighborhoods within 2 miles of the project site are Bernal Heights to the southwest, and Bayview/Hunters Point to the south. Residences in the Unit 7 project area are mostly single-family and multi-family homes or apartments adjacent to one another (Mirant 2000a, pages 8.11-6 and 8.112-2).

As with all pollution sources of potential health significance, individuals to be exposed in Unit 7's impact area would include both those with normal response to the biological effects of environmental pollutants and those with heightened sensitivity to such exposures. These sensitive individuals include children, pregnant women, the elderly and individuals with respiratory diseases such as asthma and emphysema. They may be found in relatively small numbers in individual residences, or in relatively large numbers in specific establishments or institutions such as schools, daycare centers, eldercare homes hospitals, or recreation centers.

Exposure limits against the non-cancer impacts of criteria and non-criteria pollutants are established with safety margins necessary to protect against health symptoms among both the general public and these sensitive individuals. These margins of safety are established from health effects information as available during the standard setting period. As more becomes known from further studies, each standard is revised to ensure the health protection at issue. Such sensitivity to non-

cancer impacts does not necessarily apply to cancer-causing effects whose underlying biological mechanisms are different.

As with other urban areas, many institutions and establishments with large numbers of sensitive receptors are found in the area around the proposed project. According to information from the applicant (Mirant 2000a, page 8.12-2), there are in this regard, 70 schools, 48 daycare centers, 22 hospitals or long-term care facilities, and 49 parks or recreation centers within a 3-mile radius of the project site. In assessing the significance of such widespread presence, staff would note that merely belonging to a sensitive subgroup does not mean that health effects would necessarily result from exposure to the pollutants in question. It only means, in the case of Unit 7, that its toxic emissions would be more likely to result in widespread health complaints if exposure were above applicable regulatory limits. The potential for such above-limit exposures is assessed through established methods.

METHOD OF ANALYSIS

Any air toxics-related health risks from operating the proposed Unit 7 and similar projects would mainly be associated with emissions from their natural gas-fired combustion turbines. For the surrounding population, the risk of cancer or non-cancer health effects is assessed from exposure estimates obtained from dispersion modeling. The potential for cancer is considered particularly important in regulating the types of involuntary exposures associated with Unit 7 and similar sources because of the present assumption by most scientists that there is no “safe” exposure to a carcinogen, meaning that every exposure is capable of a theoretical cancer risk, which should be eliminated to the extent feasible. This contrasts sharply with non-cancer effects which are assumed to result only from exposure above specific levels. The procedure used for such impact assessment is known as a health risk assessment, which consists of the following steps:

- A hazard identification step in which each pollutant of concern is identified along with possible health effects;
- A dose-response assessment step in which the relation between the magnitude of exposure and the probability of effects is established;
- An exposure assessment step in which the possible extent of pollutant exposures from a project is established for all possible pathways by dispersion modeling; and
- A risk characterization step in which the nature and the magnitude of the possible human health risk is assessed.

HEALTH EFFECTS ASSESSED

The types of air toxics-related health impacts of concern in this analysis are those that can result shortly after exposure or following long-term (or chronic) exposure. Those from short-term exposure are known as acute effects and generally result from exposure at relatively high levels. Some examples of pollution-induced non-cancer health effects include headaches, dizziness, coughing, nausea, asthma, rash, and irritation of any part of the body such as the eyes, throat and skin. According to present understanding, only those effects from chronic exposure are capable of causing cancer. Since non-cancer effects are assumed to result from

exposure above specific thresholds, an assessment for possible impacts will include consideration of background levels of the pollutants being considered. For the toxic combustion-related pollutants of concern in this analysis, data on background levels is not normally available since such pollutants (a) are emitted at much lower levels than the criteria pollutants and (b) are degraded much more rapidly in the atmosphere because of their reactive nature.

For Unit 7 and other modern gas-fired facilities, high-level toxic exposures (at levels capable of acute effects) could occur only during major accidents, not during routine operations when emissions are much lower. Since acute health impacts are not commonly associated with routine operation of such facilities, effects from chronic exposures are considered of greater concern than acute effects in assessing the potential for significant human health impacts. Compliance with air district-mandated emission control technologies is reflected by the incremental cancer and non-cancer risk estimates calculated for toxic pollutants. These risk estimates are calculated the same way for gas-fired power plant projects. Therefore, they can be used, despite underlying scientific uncertainties, to compare similar projects for compliance with the best emission control technologies as currently identified by the ARB.

ESTIMATING THE RISK OF NON-CANCER EFFECTS

The method used by regulatory agencies to numerically assess the likelihood of acute or chronic impacts of air toxics is the hazard index method. In this approach, a hazard index is calculated as a numerical representation of the likelihood of significant health impacts at the exposure levels expected for the source being considered. This index is calculated by dividing the exposure estimate by the applicable reference exposure level. After calculating the hazard indices for the individual pollutants, these indices are added together for all those that affect the same part of the body or target organ, to obtain a total hazard index for the source. Total hazard indices of 1.0 or less are regarded as indicating a lack of potentially significant health impacts while an index of more than 1.0 may indicate a significant potential for the non-cancer effects being considered.

ESTIMATING THE RISK OF CANCER

Since cancer is currently considered possible from every exposure to a carcinogen, staff and other regulatory agencies generally consider the risk of cancer manifestation as more sensitive than the risk of non-cancer effects for assessing the environmental acceptability of a source of both carcinogens and non carcinogens. This accounts for the prominence of theoretical cancer risk estimates in the environmental risk assessment process.

For any source of specific concern, the risk of operations-related cancer is obtained by multiplying the exposure estimate by the potency factors for the individual carcinogens to be emitted. These potency factors are numerical values established to represent the cancer-causing potential of one carcinogen as compared to the others. After calculating these individual risk values, they are added together to obtain the total incremental cancer risk from operations. Given the conservatism in the various phases of this risk calculation process, these numerical estimates are

regarded as only representing the upper bounds on the cancer risk at issue. The actual risk will likely be lower and could indeed be zero. The significance of these estimates as indicators of a real cancer hazard is assessed according to specific evaluative criteria.

STAFF'S SIGNIFICANCE CRITERIA

Various state and federal agencies specify different cancer risk levels as levels of significance with regard to specific sources. For example, a risk of 10 in a million is mostly considered under the Air Toxics "Hot Spots" (AB 2588) and the Proposition 65 programs as significant, and therefore, used as a threshold for public notification in cases of air toxics emissions from existing sources.

The Energy Commission staff considers a potential cancer risk of one in a million as the de minimis level, which is the level below which the related exposure is considered negligible (meaning that project operation is not expected to result in any increase in cancer). Above this level, further mitigation could be recommended after considering the limitations of the risk assessment process. This regulatory approach is intended to limit the rate of addition to the already high (1 in 3, or 330,000 in a million) background cancer risk of the average individual. While the cause of cancer is well known with respect to some types of cancer, the causes of most of human cancers remain largely unknown. What has become clearer to scientists however, is that environmental pollutants are responsible for only a small fraction of human cancers in general. The present risk-based regulatory approach is intended to avoid all avoidable human carcinogenic exposure especially when such exposures are not within the individual's control, as with Unit 7 and other sources.

For non-carcinogenic pollutants, staff considers significant health impacts to be unlikely from project operations when the total hazard index is 1.0 or less. If more than 1.0, staff would regard the related emissions as potentially significant from an environmental health perspective but would recommend specific mitigation only after considering the uncertainties in the assessment process.

IMPACTS

PROJECT SPECIFIC IMPACTS

The health impacts from exposure to the air toxics of concern in this analysis can be assessed separately for the proposed Unit 7 project as construction-phase impacts and operational-phase impacts.

CONSTRUCTION PHASE IMPACTS

Possible construction-phase health impacts, as noted by the applicant (Mirant 2000a, pages 8.1-4 through 8.1-7), are those from human exposure to (a) the windblown dust from site grading, excavation, and other construction-related activities, and (b) emissions from the heavy equipment and vehicles to be used in such activities. Any impacts from wind-blown dust would be mostly related to

PM10, which is a criteria pollutant as previously noted. The applicant's proposed mitigation to ensure compliance with applicable air district rules is presented in the **Air Quality** section along with the implementing conditions for certification. Staff's main concern about possible air toxics exposure is related to the presence of soil-bound contaminants from past industrial activities at the project site (Mirant 2000a, Appendices D and M). As noted by the applicant, PG&E is responsible as the former owner, for removing all these soil contaminants before the start of construction, as required by the City and County of San Francisco (Mirant 2000a pages 2-226 and 2-27). The implementing condition for certification is specified in the **Waste Management** section. Such contaminant removal would allow for on-site construction activities without a significant health hazard to humans.

The information from the applicant (Mirant 2000a, pages 8.18, 8.1-43 and Appendix F4) shows that the toxic components of construction equipment emissions would be at levels without significant health impacts on site or along the route of the underground line for the relatively short (24-month) construction period involved. Compliance with applicable air quality standards and mitigation measures is discussed in the **Air Quality** section with respect to the criteria pollutants.

DIRECT OPERATIONAL IMPACTS

As noted by the South Coast AQMD (2000, page 6), one characteristic that distinguishes the air toxics of concern in this analysis with the criteria pollutants is that their impacts tend to be highest in close proximity to their sources and quickly drop off with distance from them. This means that the levels of Unit 7's air toxics would be highest immediately around it and decrease rapidly as one moves towards the surrounding neighborhoods. The point at issue in this analysis is whether or not such exposures would be at levels of possible health significance as established using existing assessment methods.

The applicant's estimates of Unit 7's contribution to the area's risk of cancer and non-cancer effects were obtained from a health risk assessment conducted according to procedures specified in the 1993 California Air Pollution Control Officer's Association (CAPCOA) guidelines. The results from this assessment were provided to staff along with documentation of the assumptions used (Mirant 2000a, pages 8.6-2 through 8.6-9). Such documentation was provided with respect to the following:

- Pollutants considered;
- Emission levels assumed for the pollutants involved;
- Dispersion modeling used to estimate potential exposure levels;
- Exposure pathways considered;
- The cancer risk estimation process;
- Hazard index calculation; and
- Characterization of project-related risk estimates.

Staff has found these assumptions to be acceptable and concur with the applicant's findings with regard to the numerical public health risk estimates expressed either in terms of the hazard index for each non-carcinogenic pollutant, or a cancer risk for

estimated levels of the carcinogenic pollutants. These analyses were conducted to establish the maximum potential for acute and chronic effects on body systems such as the liver, central nervous system, the immune system, kidneys, the reproductive system, the skin and the respiratory system.

The following noncriteria pollutants were considered with respect to non-cancer effects: ammonia from the use of the selective catalytic reduction (SCR) system for NO_x control, acetaldehyde, acrolein, benzene, 1,3 butadiene; ethylbenzene, formaldehyde, hexane, naphthalene, polycyclic aromatic hydrocarbons (PAHs), propylene oxide, toluene, and xylenes. The following were considered with regard to a possible cancer risk: acetaldehyde, benzene, 1,3 butadiene, formaldehyde, PAHs and propylene oxide.

A maximum chronic hazard index of 0.1415 was calculated for the maximally exposed individual at a location within an industrial site near the northeastern facility boundary of Potrero PP. The maximum chronic hazard at the nearest sensitive receptor location (the Potrero Hill Recreation Center) was calculated as 0.023. A maximum acute hazard index of 0.5141 was calculated for the same Potrero Hill Recreation Center about one half-mile from the proposed project. Since these indices are significantly below significance value of 1.0, they suggest that the project's toxic emissions would be unlikely to pose a significant risk of immediate-onset or delayed non-cancer effects to any individual, either in the immediate vicinity of the projects or the surrounding neighborhoods.

The highest combined cancer risk was estimated to be 0.658 in a million for an individual at the same industrial site location identified with respect to chronic non-cancer impacts. This cancer risk was calculated using existing procedures in which the individual at risk is conservatively assumed to be potentially exposed at the highest possible levels to all the carcinogenic pollutants from the project for a 70-year lifetime. This risk value is significantly below staff's de minimis level, meaning that the project's carcinogenic emissions would be unlikely to pose a significant cancer risk anywhere within the surrounding population.

Economic and demographic analyses by the applicant (Mirant 2000a pages 8.8-1 through 8.8-11, and Appendix Q) identified specific areas with predominantly minority residents in the Potrero Hills and other neighborhoods around the project. Details of residency patterns within these locations are provided in the **Socio-Economics** section. These minority and low-income populations warrant special consideration because of their usually higher-than-normal incidence of asthma and other respiratory diseases that render them susceptible to the effects of air pollution. As noted by the applicant (Mirant 2001DResSAEJ2, Data Response N0. 102) for example, one study by the San Francisco Department of Health shows the 10 percent incidence of asthma among adults and 15.5 % among children in the Bayview-Hunters Point area as much higher than the rates in other large cities. The reasons for these high rates are not adequately understood. What is clear at the present is the need to avoid exposure increases in such areas to the extent feasible. Since staff has determined that the cancer and non-cancer risk from the proposed Unit 7 project would be at levels of relative insignificance for all the areas

surrounding the proposed facility, there will be no significant public health impacts on any area population groups including minority or low-income populations.

CUMULATIVE IMPACTS

When toxic pollutants are emitted from multiple sources within a given area, the cumulative, or additive, impacts of such emissions could, in concept, lead to significant health impacts within the population, even when such pollutants are emitted at insignificant levels from the individual sources involved. Analyses of such emissions have shown, however, that the peak impacts of such toxic pollutants are normally localized within relatively short distances from the source. Toxic pollutant levels beyond the point of maximum impact quickly fall within ambient background levels. The proposed Unit 7 project is a power generation upgrade at an existing power generation facility located at a site already committed to power generation and related industrial and commercial activities. Given the low cancer and non-cancer risks from the project's toxic emissions, staff does not expect the project to contribute significantly to any area toxic exposure of a cumulative nature.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff has determined that the construction and operation of the proposed natural gas-burning Unit 7 project will not significantly impact the health status of the surrounding population with respect to the toxic pollutants considered. The conditions for ensuring compliance with all applicable air quality standards have been specified in the **Air Quality** section for the area's problem criteria pollutants. One point at issue is the health protectiveness of the existing standards as now being re-assessed using results from studies conducted since these standards were set. This is particularly true for particulate matter and ozone. Until the underlying issue is resolved by the regulatory agencies, health protectiveness will continue to be assessed using these existing standards

RECOMMENDATIONS

Since the project's cancer and non-cancer risks would be at levels reflecting controls with technology established by the ARB as most effective for this and similar facilities, staff recommends that the proposed Unit 7 project be certified without any design or operational changes. It is for this reason that no Public Health Conditions of Certification are proposed.

REFERENCES

California Air Resources Board (ARB) 1996. California Toxic Emissions Factors (CATEF) Database for Natural Gas-Fired Combustion Turbine Cogeneration.

California Air Pollution Control Officers Association (CAPCOA) 1993. Air Toxics "Hot Spots" Program, Revised 1992 Risk Assessment Guidelines. Prepared by the Toxics Committee, October 1993.

MIRANT (Mirant Corporation) MIRANT 2000a. Application for Certification, AFC, for the Potrero Power Plant Unit 7 Project (00-AFC-4). Volumes II and I. Submitted to the California Energy Commission May 31, 2000.

MIRANT (Mirant Corporation). MIRANT 2001DRespSAEJ. Mirant responses to Southeast Alliance for Environmental Justice, Data Requests, Set 1, Nos. 1-155, Potrero Power Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission February 217, 2001.

South Coast Air Quality Management District 2000. An Air Toxics Control Plan for the Next Ten Years. March 2000. South Coast Air Quality Management District publication.

SOCIOECONOMIC RESOURCES

Michael Fajans and Amanda Stennick

INTRODUCTION

The technical area of Socioeconomics includes several related areas of interest and concern. A typical socioeconomic impact analysis evaluates the effects of short-term and long-term project-related population changes on local schools, medical and protective services, as well as the fiscal and physical capability of local governmental agencies to meet the needs of project-related changes in population. The socioeconomic analysis also includes consideration of Environmental Justice, a determination of whether any project impacts fall disproportionately on a low-income or minority population.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

Executive Order 12898, "Federal Actions to address Environmental Justice (EJ) in Minority Populations and Low-Income Populations," focuses federal attention on the environment and human health conditions of minority communities and calls on federal agencies to achieve environmental justice as part of this mission. The order requires the U.S. Environmental Protection Agency (USEPA) and all other federal agencies (as well as state agencies receiving federal funds) to develop strategies to address this issue. The agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

Civil Rights Act of 1964, Public Law 88-352, 78 Stat.241 (Codified as amended in scattered sections of 42 U.S.C.) Title VI of the Civil Rights Act prohibits discrimination on the basis of race, color, or national programs in all programs or activities receiving federal financial assistance.

STATE

14 CALIFORNIA CODE OF REGULATIONS, SECTION 15131

- Economic or social factors of a project may be used to determine the significance of physical changes caused by the project.
- Economic, social and particularly housing factors shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a project are feasible to reduce and or avoid the significant effects on the environment.

CALIFORNIA GOVERNMENT CODE, SECTION 65995-65997

SB 50 and other statutory amendments enacted in 1998 provide that, notwithstanding any other provisions of local or state law (including CEQA), state

and local agencies may not require mitigation for the development of real property for effects on school enrollment except as provided by Government Code Section 65996(a). The relevant provisions restrict fees for the development of commercial and industrial space to a maximum of \$0.31 per square foot of “chargeable covered and enclosed space.” (Govt. Code, § 5995(b)(2))

SETTING

DEMOGRAPHIC CHARACTERISTICS

San Francisco is a distinct city. Relative to most others in California, it is much older and is far more densely populated, with approximately 800,000 people in only 49 square miles. With the exception of parks, the city is built out, and population growth occurs through intensification of land use, both market driven and Redevelopment Agency assisted redevelopment.

San Francisco has an economically and racially diverse population and is home to many cultures. It exhibits the range of urban issues typical of large cities. San Francisco is a major business center in finance, and like many central cities, has lost much of its manufacturing activity to more suburban, low-density communities. Domestic and international tourism has become a major element in the city's economy.

San Francisco County is the historic center of the San Francisco Bay Area, the nine counties that make up the region. San Francisco has unique demographic characteristics relative to the state and region. In 1990, San Francisco's population represented about 12 percent of the regional population of six million. San Francisco's population increased to approximately 801,000 by 2000 (Department of Finance), a 10 percent growth rate substantially greater than the 6.6 percent growth rate from 1980 to 1990. Nevertheless, San Francisco represents a declining share of the regional population, as other counties grow at a more substantial rate.

Socioeconomics Table 1 illustrates Association of Bay Area Government's (ABAG) Bay Area regional growth estimates from 1990 to 2000, and projections from 2000 to 2020. San Francisco's population is only expected to increase by one percent from 2000 to 2020 while the regional population expands almost 16 percent.

Compared to regional characteristics, the 1990 San Francisco population was older on average, with only 14 percent of the residents aged under 16 compared to 20 percent in the region, and 15 percent over the age of 65, somewhat above regional and state proportions of elderly population.

SOCIOECONOMICS TABLE 1: Bay Area Population Trends

Counties	1990	1995	2000	2005	2010	2015	2020
Alameda	1,276,702	1,345,900	1,462,700	1,573,200	1,615,900	1,641,700	1,671,700
Contra Costa	803,732	865,300	941,900	1,021,500	1,076,800	1,124,900	1,169,000
Marin	230,096	238,500	250,400	259,900	267,900	272,400	275,400
Napa	110,765	117,500	127,600	137,000	141,900	148,500	156,900
San Francisco	723,959	751,700	799,000	815,600	818,800	812,900	808,800
San Mateo	649,623	687,500	737,100	767,100	779,700	795,700	809,800
Santa Clara	1,497,577	1,599,100	1,755,300	1,854,000	1,919,000	1,970,600	2,016,700
Solano	339,471	370,700	401,300	450,300	481,700	514,800	547,400
Sonoma	388,222	418,100	455,300	501,500	529,700	551,100	571,200
Region	6,020,147	6,394,300	6,930,600	7,380,100	7,631,400	7,832,600	8,026,900

Source: ABAG Projections 2000

Please refer to the section on Environmental Justice for a discussion on low-income and minority demographics within a six-mile radius of the project, the City and County of San Francisco, and the Bay Area.

EMPLOYMENT CHARACTERISTICS

Year 2000 employment levels for the Bay Area were estimated by ABAG at 3.7 million, an increase of 15 percent from 1990 (ABAG, Projections 2000). However, there was a loss of jobs during the recession early in the decade, and unprecedented growth during the past five years. San Francisco also witnessed strong employment growth during the past five years, anchored by tourism and the internet/multi-media industry. With an estimate of a San Francisco resident labor force of 438,000 in 2000 (California EDD), an unemployment level of 2.7 percent, and an employment level of 629,000 in the City, it is clear that many residents of other counties commute to San Francisco.

According to analysis in San Francisco's *1999 Commerce and Industry Inventory Economic Summary (CIIES)*, knowledge-based activities have led recent job growth. During the 1988-98 decade, education services jobs grew 39 percent; office services (including professional services) grew by 15 percent, and finance by 10 percent. Employment in the retail sector also increased by 6 percent during this time frame. The knowledge-based economy attracts firms that seek highly skilled employees. High wages for these employees allows them to pay more for housing, both in San Francisco and the wider region. This has had adverse ramifications on regional housing prices (CIIES, pages 4/5). While there are approximately 20,000 construction jobs in San Francisco, about three percent of the labor force, there were 186,000 construction jobs in the nine Bay Area counties in 2000, representing five percent of regional jobs. Several large public works construction efforts,

including the San Francisco International Airport expansion and BART extension, are winding down as major construction efforts.

Bayview Hunters Point, the neighborhood immediately south of Potrero Hill, is home to several recycling centers, auto wrecking yards, an animal rendering plant, a waste water treatment plant, two PG&E owned power plants, and hazardous waste sites at both the Port of San Francisco and the Hunters Point Naval Shipyard. The closure of the Hunters Point Naval Shipyard in the 1970s cost the area over 10,000 jobs and particularly affected the retail economy of the Third Street corridor. Additional housing and industrial development in the India Basin area have helped, but the local South Bayshore economy is still in need of additional jobs and economic base.

HOUSING

As of 2000, there were approximately 2.5 million housing units in the nine county Bay Area. In 1990, San Francisco had 328,470 housing units, with an average of 2.3 persons per household and a seven percent vacancy rate, according to the US Census. In contrast with the Bay Area, 66 percent of the San Francisco housing stock is rental, and only 34 percent of units are owner occupied. Census tract 226, which includes the proposed site, only contained 214 households in 1990, primarily in the “Dogpatch” neighborhood along Tennessee Street just west of 3rd Street. Since that time and increasing during the past few years, there has been considerable development of live-work loft type units in the area, particularly along Tennessee Street between 18th and Mariposa, but also on Minnesota at 23rd and 34th Streets. In addition, there is one new live-work development at the intersection of Mariposa and Illinois Streets, east of Third Street. In addition, there appears to be a community of people living in vehicles along Iowa Street beneath I-280 between 22nd and 23rd Streets.

Since 1990, there have been 25 housing units built in the Central Waterfront area, and 325 live-work units. In terms of citywide comparisons, there have been 9,500 new housing units built since 1990, and an additional 1,800 live-work units (Rubin, San Francisco Planning Department). Thus, almost 20 percent of new live-work units have been built in the Central Waterfront area. Development of residential and live-work units continues in the neighborhood, with 18 active applications. Six of the 18 applications are in the vicinity of the intersections of Third, 21st, and Tennessee Streets.

Since the housing characteristics from the 2000 Census are not available, it is not possible to describe the population and household characteristics of the neighborhood. However, given the prices of new units, it is clear that the area has become a more desirable neighborhood and household incomes have increased.

NEIGHBORHOODS AND BUSINESS

A variety of small to medium size industrial businesses exist in the vicinity of the project site and transmission line corridor. The Port of San Francisco Terminals 94 and 96 are located northeast of Cargo Way, and a major US Post Office facility is on the south side of Cargo Way. The closest residential district is the “Dogpatch”

neighborhood east of Potrero Hill, centered along Tennessee, Minnesota, and 22nd Streets between Third Street and I-280.

SCHOOLS

The boundaries of the San Francisco Unified School District are co-terminus with those of the City and County of San Francisco. The District has approximately 115 schools, including 77 elementary schools, and had an enrollment of approximately 60,000 students in fall 1999. The two closest elementary schools to the project site are Starr King (1215 Carolina Street) and Daniel Webster (465 Missouri Street), both approximately three-quarters of a mile west of the project site. Potrero Hill Middle School (655 De Haro Street) is approximately one mile west of the site. The International Studies Academy (693 Vermont) is the closest public high school, slightly over a mile west of the project site.

District enrollment is relatively steady, with annual fluctuations of approximately one percent. As a stable community, San Francisco is not faced with a need to build new schools to meet enrollment gains.

UTILITIES, EMERGENCY AND OTHER SERVICES

San Francisco receives gas and electric service from Pacific Gas and Electric. The San Francisco Water Department supplies water to the site from the city's Hetch Hetchy system and the Department of Public Works provides sewer service.

The San Francisco Fire Department provides fire protection and emergency medical response to the Potrero power plant site. Station 25, located approximately three-quarters of a mile south of the site, at 3305 Third Street, is the closest fire station. It was recently rehabilitated and re-opened in August 2000 (Response to Data Request 147). A second station, at 798 Wisconsin, is less than one mile to the west. Several other stations are located two to three miles from the site. Each San Francisco fire station has one officer and three firefighters on duty at all times (AFC, page 8.8-11).

San Francisco General Hospital, a full-service 550-bed facility, is located on Potrero Avenue, about 1.5 miles from the site. A community health clinic is located on Wisconsin Street in the Potrero Hill neighborhood, and several private medical clinics exist within a mile of the site. The San Francisco Police Department provides law enforcement. The closest station (Bayview Station) is at 201 Williams Street.

PUBLIC FINANCE

The City and County of San Francisco (CCSF) has an annual budget of approximately \$4.2 billion, but this includes enterprise funds (water, airport, etc.), public transit, and public health. Total discretionary spending is about \$1.2 billion, of which 40 percent is for public protection services (Mayor's Budget, 1999-2000). Only 13 percent of total CCSF funds are derived from property taxes, or approximately \$550 million. Other significant local taxes include payroll taxes, sales taxes, and hotel taxes. In fiscal year 1997, the existing Potrero power plant generated \$671,000 in property taxes (AFC, page 8.8-13), slightly more than one

percent of the CCSF total property tax revenues. The primary recipients of property tax revenues in San Francisco include the General Fund (51 percent), the San Francisco Unified School District General Fund and Educational Augmentation Fund (29 percent), and the City Bond Debt Fund (11 percent). A variety of smaller funds receive the remaining nine percent.

IMPACTS

PROJECT-SPECIFIC IMPACTS

Staff reviewed the Potrero Power Plant Unit 7 Project Application for Certification (00-AFC-4) Volume 1, May 2000, Socioeconomic Section 8.8 and Appendix Q – Socioeconomics. The analysis evaluates conditions and potential impacts on population, housing, employment, public services and utilities. In addition, the analysis considers environmental justice. The applicant used appropriate public databases, such as California Employment Development Department, US Census Bureau, and information from local agencies for their analysis. Staff's analysis is based on verification of the information in the AFC and independent research as described below. Staff finds the AFC's socioeconomic analysis and conclusions to be acceptable.

EMPLOYMENT

Peak employment at the project site during the 24-month construction period would be 287 workers, including 247 craft workers and 40 contractor staff.

Socioeconomics Table 2 shows the various trades that would be involved and the number of each required for each month of the construction period. The amendment to eliminate the brick façade around the power generation equipment will not affect the number of craft workers at any time during the construction period.

In the Bay Area economy, with over three million jobs, the peak construction employment of 287 workers would represent less than 0.2 percent of the construction labor force. The latest California Employment Development Department (EDD) labor force statistics show a construction employment of 46,800 for San Francisco, Marin, and San Mateo Counties for December 2000, including 25,000 in special trades. The cities of San Jose and Oakland are also within commute distance, and they would add 118,000 construction workers to the regional total. EDD staff confirms that there should be an available labor force within commute distance of the project.

HOUSING

Construction of the Potrero Power Point is not expected to have a significant impact on housing demand in the San Francisco Bay Area. As described in the previous section, there is a large construction labor force within commute distance, and this project is one of a continuum of large construction projects that provide employment for the specialist trades cited as required in **Socioeconomics Table 2**. Even if there were a temporary shortage of workers in a specific trade, the Bay Area has a

large rental housing supply (more than 700,000 units) as well as motels that would be available for workers on temporary assignment.

The number of workers (11) required to operate the plant is small, and should not have any impact on San Francisco housing demand.

NEIGHBORHOODS AND BUSINESS

Construction of the on-site portions of the project will not have adverse impacts on the neighborhood or businesses in the area. Workers may purchase food and related items in neighborhood businesses, improving retail activity during the construction period. Construction of the underground cable portion along Illinois Avenue, Cargo Avenue, and Jennings Street, as well as under Islais Creek, has the potential to cause temporary adverse disruption of access to businesses along this corridor. With proper community outreach and notification, as well as careful construction staging and implementation of traffic detours, this can be reduced to a less than significant impact.

Construction staging for the Islais Creek undercrossing could encroach on several businesses located where Illinois Street ends at the Creek. Several weeks will be required to stage and construct the undercrossing, but with coordination, this should not disrupt access to any adjacent businesses in a manner that would have adverse impacts.

SCHOOLS

Because of the large resident labor force available for construction and small permanent labor force that will operate the proposed project, there will not be any enrollment impacts on the San Francisco Unified School District. One-time school impact fees of \$35,700 would be generated by the school district fee of \$.15 per square foot of heavy industrial development (AFC, page 8.8-18).

PUBLIC FINANCE AND FISCAL

Construction of the proposed project will generate one-time sales tax receipts, but since the majority of supplies and equipment will be purchased outside the Bay Area (and much of it outside of California), little sales tax in California will be generated by the project (SECAL 2000a). On-going property tax generation will be significant depending on the assessed value of the improvements. If the investment in the project is \$300 million, approximately \$3 million annually in property taxes will be generated for the San Francisco General Fund, the San Francisco Unified School Districts, and other agencies.

SOCIOECONOMICS TABLE 2
PROJECTED MONTHLY CONSTRUCTION LABOR BY CRAFT

Craft Type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Demolition Supervisor	1	1	1																					
Laborers	7	10	14	15	20	20	25	25	20	20	20	20	20	16	16	16	16	15	12	10	8	5	5	5
Carpenters/ Millwrights	1	4	12	20	25	20	25	25	20	20	20	15	15	15	10	10	10	7	7	2	2	2	2	2
Ironworkers					3	5	10	20	20	20	20	20	15	10	10	5	3	2						
Heavy equip. Operator	8	14	16	12	12	11	10	10	7	6	6	6	6	6	5	5	4	4	3	2	1	1	1	
Teamsters	2	6	8	8	5	5	4	4	4	3	3	2	2	2	2	2	2	2	2	1	1	1		
Electricians			1	3	5	7	10	10	20	25	25	30	30	50	50	50	45	40	30	30	20	15	10	5
Pipefitters			2	5	8	12	20	20	30	50	75	100	100	100	100	100	100	75	65	35	15	3	5	3
Boilermakers								3	11	20	35	32	40	40	40	40	40	25	25	5				
Insulators														5	5	7	18	18	18	18	15	10	5	3
Painters															1	2	3	3	3	3	2	2	2	2
Cement finishers/masons		1	2	3	3	4	4	4	4	3	3	2	2	1	1	1	1	1	1	1				
Mechanics		1	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1		
Surveyors	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1							
Total craft labor	17	35	55	70	86	88	112	125	140	170	200	230	232	247	242	240	244	193	167	108	65	40	30	20
Contractor staff	9	14	19	20	20	25	25	30	30	35	40	40	40	40	40	40	40	35	30	25	20	15	10	5
Total labor	26	49	74	90	105	113	137	155	170	205	240	270	272	287	282	280	284	228	197	133	85	55	40	25

Source: AFC Table 8.8-8

ENVIRONMENTAL JUSTICE SCREENING ANALYSIS

The purpose of the screening analysis is to determine whether there exists a low-income and/or minority population, which may be exposed to disproportionately high and adverse human health or environmental effects as a result of the proposed project. For all siting cases, Energy Commission staff conducts the screening analysis in accordance with the “Final Guidance for Incorporating Environmental Justice Concerns in USEPA’s National Environmental Policy Act (NEPA) Compliance Analysis” dated April 1998.

Minority populations, as defined by USEPA’s guidance document, are identified where either:

- The minority population of the affected area is greater than fifty percent of the affected area’s general population; or
- The minority population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

The Guidance does not define the term “affected area”, however it states that the analyst should interpret the term “as that area which the proposed project will or may have an effect on.” Typically, Energy Commission staff has defined the affected area as the area potentially impacted by the proposed project in the areas of air quality, public health, noise, water, traffic, and visual resources. This area has been determined by Energy Commission staff as that area within a six-mile radius of the proposed site. However, because of the high population densities in San Francisco and Bay Area, staff believes it is appropriate to also look at populations within 1-, 2-, and 4- mile radii of the site, and populations within San Francisco and the Bay Area as a whole, when doing an environmental justice screening analysis.

MINORITY AND LOW-INCOME POPULATION ANALYSIS

Socioeconomics Table 3 contains 2000 population estimates for minority populations within 1-, 2-, 4, and 6-mile radii of the project, the City and County of San Francisco, the Bay Area, and the State of California. **Socioeconomics Table 4** contains 1990 census data for low-income populations within 1-, 2-, 4, and 6-mile radii of the project, the City and County of San Francisco, the Bay Area, and the State of California. Census 2000 data on poverty is not yet available.

Socioeconomics Figure 1 shows population and USEPA environmental data within the six-mile radius.

Based on the screening process for environmental justice, the data in **Socioeconomics Table 3** show several populations with high percentages of minority residents within a six-mile radius of the project, with almost 81 percent minority residents living within a two-mile radius. Data from this table also shows similar percentages of minority populations in the City and County of San Francisco, Bay Area, and the State of California. Because the screening analysis shows that there is an environmental justice population present, various technical staff were

informed that they should evaluate for disproportionate impacts on the minority population if an unmitigated, significant impact is identified.

SOCIOECONOMICS TABLE 3: Minority Populations

	Total Population ¹	Minority Population ²	Percent Minority
1 Mile Radius	10,750	5,635	52.4%
2 Mile radius	99,912	80,867	80.9%
4 Mile Radius	506,283	328,198	64.8%
6 Mile Radius	873,250	569,290	65.19%
City and County of San Francisco	768,764	498,497	63.6%
Bay Area ³	6,731,022	3,224,495	47.9%
State of California	33,560,448	17,100,904	51%
Source: Claritas population estimates. Minority includes non-white and white-Hispanic populations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties.			

Socioeconomics Figure 1

SOCIOECONOMICS TABLE 4: Low-Income Populations

	Population Below Poverty Level ¹	Percent Below Poverty Level
1 Mile Radius	1,849	22.3%
2 Mile radius	17,449	18.9%
4 Mile Radius	70,090	14.4%
6 Mile Radius	92,177	12.3%
City and County of San Francisco	90,019	12.7%
Bay Area ²	502,354	8.5%
State of California	3,627,585	12.5%
1. Source: 1990 US Census. 2. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties.		

The poverty threshold for a family of four persons was \$12,674 per year (1990 US Census Data). To determine the number of persons below the poverty level, Energy Commission staff reviewed data from the 1990 US Census: Poverty Status By Age; Universe: Persons for whom poverty status is determined. Because the guidelines do not give a threshold to determine the existence of a low-income population, Energy Commission staff uses the fifty-percent threshold used for minority populations. The data in **Socioeconomics Table 4** indicates that there is not a greater than fifty percent population of low-income people within the project area.

COMMUNITY CONCERNS

In response to long-term community concerns with the Potrero Plant, the San Francisco Board of Supervisors initiated a Citizens Advisory Committee on Potrero, chaired by Supervisor Yee's office. Also, there are several community groups who are participating as Intervenors, including Southeast Alliance for Environmental Justice (SAEJ), Potrero Boosters Association, Potrero Neighborhood House, Bayview Hunters Point (BVHP) Community Activists, Our Children's Earth Foundation (OCE), and Citizens for a Better Environment (CBE). Some of these groups, including representatives from the City and County of San Francisco have held monthly meetings on the proposed project since June 2000.

In March 2000, Energy Commission Public Health and legal staff met with representatives from the City and County of San Francisco Department of Public Health, City and County of San Francisco BVHP Health and Environmental Assessment Task Force, City and County of San Francisco Planning Department, BVHP Community Activists, and UCSF. The discussion focused on health and environmental issues associated with the Potrero plant and other industrial uses in the Bayview and Potrero neighborhoods. Please refer to the section on **Public Health** for further information regarding public health issues associated with the project.

On April 12, 2001, Energy Commission staff held an environmental justice outreach meeting in Potrero Hill. Meeting notices were mailed to everyone on the Proof of Service (POS) List, including Claude Wilson, Executive Director of SAEJ, Alan Ramo, Counsel for SAEJ, Tiffany Schauer, Executive Director for OCE, Anne Simon at CBE, and John DeCastro, President of Potrero Boosters Neighborhood Association, Californians for Renewable Energy (CARE), and the general mailing list, which includes property owners and concerned citizens who have attended prior meetings and have asked to be put on the mailing list. In addition, the Commission Public Advisor's Office Staff sent flyers of the meeting to local public schools. At the April 12 meeting, staff gave a presentation of the three primary components of an environmental justice analysis: demographics, public outreach, and impacts assessment.

Because of community concerns regarding inadequate outreach by the Energy Commission, staff will hold another environmental justice outreach meeting in the Potrero Hill neighborhood sometime before the Final Staff Assessment (FSA) is completed. Because the Potrero Hill Neighborhood House was not available in May or June, the expected date for the meeting is July 9, 2001.

CUMULATIVE IMPACT

There are a number of projects on-going or anticipated that could partially overlap with the construction of the proposed project. Development of the Mission Bay campus of the University of California San Francisco is underway at the intersection of Third and 16th Streets in the Mission Bay area. San Francisco MUNI has initiated development of a train storage and maintenance facility at 25th Street and Illinois Street, and anticipates construction of the Third Street light rail project. Smaller projects, including the development of live-work units, are expected to continue in the Central Waterfront area.

Other larger projects that require a substantial construction labor force include the retrofitting of the West Span of the Bay Bridge and Central Freeway in San Francisco, as well as the anticipated construction of the replacement East Span of the Bay Bridge. There may be construction of other power plants within the Bay Area. The only potential impact from a cumulative socioeconomic point of view would be possible shortage of workers in some trades. However, given the large work force in the construction trades in the Bay Area, and the on-going series of major projects (Caltrans, San Francisco International Airport, BART, etc.), staff believes that there is an adequate number of available workers. Even if a small number of workers temporarily relocated to work on the proposed project, their presence in the area's housing market would be a less than significant impact due to the constant turnover of workers and households.

MITIGATION

Staff believes that the economic and fiscal impacts of the project will be a benefit to the region and City of San Francisco in terms of increased economic activity and tax revenues to local agencies.

Staff is proposing a condition where the project owner will work with project area businesses to ensure that the construction process, particularly for the underground transmission line connection to the Hunters Point substation, will not significantly disrupt business activity. Contractors and subcontractors involved with the process will take all feasible measures to mitigate the construction impacts on access to active businesses in the project area, consistent with the CCSF Department of Planning and Traffic Regulations for Working in San Francisco Streets.

CONCLUSIONS AND RECOMMENDATIONS

Staff has determined that there will be no construction and operation-related impacts to housing, schools, and public services. To ensure that some economic benefit occurs in the project area, staff has proposed a condition of certification that requires the project owner and its contractors and subcontractors to recruit employees and procure materials and supplies locally. Staff also proposes a condition of certification requiring the project owner to pay a one-time school impact fee based on the San Francisco Unified School District's fee schedule of \$.15 per square foot for industrial development.

If the Energy Commission certifies the proposed project, staff recommends that it adopt the following conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

SOCIO-1 The project owner and its contractors and subcontractors shall recruit employees and procure materials and supplies within the nine county San Francisco Bay Area unless:

- To do so will violate federal and/or state statutes;
- The materials and/or supplies are not available;
- Qualified employees for specific jobs or positions are not available; or
- There is a reasonable basis to hire someone for a specific position from outside the local area.

Verification: At least 60 days prior to the start of demolition, the project owner shall submit to the Energy Commission Compliance Project Manager (CPM) copies of contractor, subcontractor, and vendor solicitations and guidelines stating hiring and procurement requirements and procedures. In addition, the project owner shall notify the CPM in each Monthly Compliance Report of the reasons for any planned procurement of materials or hiring outside the local regional area that will occur during the next two months.

SOCIO-2 The project owner shall pay the one-time statutory school facility development fee as required at the time of filing for the in-lieu building permit with the San Francisco Building Department.

Verification: The project owner shall provide proof of payment of the statutory development fee in the next Monthly Compliance Report following the payment.

SOCIO-3 Prior to start of construction of the underground transmission line, the project owner shall provide a written notice of the proposed schedule and traffic control techniques that will be employed during construction to businesses and institutions that could be affected along the right-of-way.

Verification: At least 30 days prior to start of construction of the underground transmission line, the project owner shall distribute the notice to all potentially affected businesses and institutions along the affected right-of-way. The project owner shall provide proof of mailing or other appropriate documentation in the next Monthly Compliance Report following the distribution.

REFERENCES

Association of Bay Area Governments (ABAG) 1999. Projections-2000: Forecasts for the San Francisco Bay Area to the Year 2000. December 1999.

Claritas-Connect 2000. Claritas, Inc. Arlington, Virginia. Connect Study Reports of Race and Hispanic Individuals Within 2 Miles, 4 Miles, and City of San Francisco. December 6, 2000.

Employment Development Department. State of California 2000. Internet website www.lmi4ed.ca.gov/reports

Nguyen, Thinh. San Francisco Water Department City Distribution Division, oral communication with Diana Cardenas, Camp Dresser & McKee and forwarded to Michael Fajans, January 17, 2001.

Rubin, Jasper, 2000. San Francisco Planning Department, oral communication with Katie McKinstry, URS Corp., January 10, 2001.

San Francisco Mayor's Office, Mayor's Budget 1999-2000 and 2000-2001, website

San Francisco Planning Department 2000. 1999 Commerce and Industry Inventory – San Francisco Economic Summary. January 2000.

San Francisco Planning Department 2000. Central Waterfront Neighborhood Plan: Summary of the Walking Tour. Internet website www.ci.sf.ca.us/planning/neighborhoodplans/cwwalktour.htm

San Francisco Planning Department. 1995. South Bayshore Plan. 1995.

San Francisco Unified School District. 2000. Internet website orb.sfusd.k12.ca.us/profile

SECAL (Southern Energy California). 2000a. Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, May 31, 2000.

SECAL (Southern Energy California). 2000b. Supplemental Information in Response to CEC Data Adequacy Request, Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, August 31, 2000.

SECAL (Southern Energy California). 2001a. Amendment to the Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Addresses the demolition of six existing structures. Submitted to the California Energy Commission, January 19, 2001.

Tam, Park-Yin. California Employment Development Department, Labor Market Information Division. Oral communication with Michael Fajans, January 17, 2001.

URS Dames and Moore (for Southern Company) 2000. Potrero Power Plant Unit 7 Project Application for Certification (00-AFC-4). Submitted to California Energy Commission on May 31, 2000.

URS Dames and Moore (for Southern Company) 2000. Responses to CEC Data Requests 145-147 on Potrero Power Plant Unit 7 Project. Submitted to California Energy Commission on December 21, 2000.

U.S. Census Bureau 2000. Internet website www.census.gov.

TRAFFIC AND TRANSPORTATION

James Fore

INTRODUCTION

The Traffic and Transportation section of the Preliminary Staff Assessment (PSA) addresses the extent to which the Potrero Power Plant Unit 7 Project (Unit 7) expansion may impact the transportation system within the vicinity of its present operation. Staff's analysis includes the evaluation and identification of:

- The influx of construction workers for the expansion project and how they could increase roadway congestion and affect traffic flow during the construction phase;
- The roads and routings which the project proposes to use;
- Potential traffic related problems associated with those routes;
- The anticipated deliveries of oversize/overweight equipment;
- The anticipated encroachment upon public right-of-ways during the construction of the proposed expansion project and associated appurtenant facilities;
- The frequency of trips and probable routes associated with the delivery of hazardous materials;
- The availability of alternative transportation methods such as rail; and
- The impact of Unit 7 construction activity on the barge and vessel traffic in San Francisco Bay.

Staff has analyzed the traffic and transportation information provided by the applicant in the Application for Certification (AFC) and other sources to determine if the project will have significant traffic and transportation impacts. Where traffic and transportation impacts were identified, staff has assessed the availability of mitigation measures that could be applied to reduce or eliminate the significance of those impacts. Conditions of certification are included to implement the appropriate mitigation measures and to ensure that the project complies with the applicable Laws, Ordinances, Regulations and Standards (LORS).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

The federal government addresses transportation of goods and materials in Title 49, Code of Federal Regulations:

- Title 49, Code of Federal Regulations, sections 171-177, govern the transportation of hazardous materials, the type of materials defined as hazardous, and the marking of the transportation vehicles.
- Title 49, Code of Federal Regulations, sections 350-399, and Appendices A-G, Federal Motor Carrier Regulations, addresses safety considerations for the transport of goods, materials and substances over public highways.
- Title 14, Code of Federal Regulations, Section 77.13(2)(I), requires an applicant to notify the Federal Aviation Administration (FAA) of construction of structures with a height greater than an imaginary surface extending outward and upward at a slope of 100 to 1 from the nearest point of the nearest runway of an airport (i.e. San Francisco and/or Oakland) with at least one runway more than 3,200 feet in length.
- Title 14, Code of Federal Regulations, Section 77.17, requires an applicant to provide Notice of Proposed Construction or Alteration (FAA Form No. 7460-1) to the FAA.
- Title 14, Code of Federal Regulations, Section 77.21, 77.23, and 77.25 outline the criteria used by the FAA to determine whether an obstruction would create an air navigation conflict.
- Title 33, Code of Federal Regulations, Navigation and Navigable Waters, Section 110.224 requires that written permission must be obtained from the Captain of the Port (Commanding Office, Marine Safety Office San Francisco Bay) prior to anchoring outside of a designated anchorage.

STATE

The California Vehicle Code and the Streets and Highways Code contain requirements applicable to the licensing of drivers and vehicles, the transportation of hazardous materials and rights-of-way. In addition, the California Health and Safety Code addresses the transportation of hazardous materials. Specifically, these codes include:

- California Vehicle Code, section 353 defines hazardous materials.
- California Vehicle Code, sections 31303-31309, regulate the highway transportation of hazardous materials, the routes used, and restrictions thereon.
- California Vehicle Code, section 31030, requires that permit applications shall identify the commercial shipping routes they propose to utilize for particular waste streams.
- California Vehicle Code, sections 31600-31620, regulate the transportation of explosive materials.
- California Vehicle Code, sections 32000-32053, regulate the licensing of carriers of hazardous materials and include noticing requirements.

- California Vehicle Code, sections 32100-32109, establish special requirements for the transportation of inhalation hazards and poisonous gases.
- California Vehicle Code, sections 34000-34121, establish special requirements for the transportation of flammable and combustible liquids over public roads and highways.
- California Vehicle Code, sections 34500, 34501, 34501.2, 34501.4, 34501.10, 34505.5-7, 34507.5 and 34510-11, regulate the safe operation of vehicles, including those which are used for the transportation of hazardous materials.
- California Vehicle Code, sections 2500-2505, authorize the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials including, but not limited to explosives.
- California Vehicle Code, sections 13369, 15275, and 15278, address the licensing of drivers and the classifications of licenses required for the operation of particular types of vehicles. In addition, it requires the possession of certificates permitting the operation of vehicles transporting hazardous materials.
- California Streets and Highways Code, sections 117 and 660-72, and California Vehicle Code 35780 et seq., require permits for the transportation of oversized loads on county roads.
- California Streets and Highways Code, sections 660, 670, 1450, 1460 et seq., 1470, and 1480, regulate rights-of-way encroachment and the granting of permits for the encroachment on state and county roads.
- California Health and Safety Code, sections 25160 et seq., address the safe transport of hazardous materials.

CITY AND COUNTY

The City and County of San Francisco (CCSF) have jurisdiction over the local roadways in the vicinity of the Potrero Power Plant. The Transportation Element of the San Francisco General Plan provides detailed requirements for traffic impact analysis. If the project generates 50 trips during peak trip periods, a traffic impact evaluation must be completed. The traffic impact analysis needs to cover the following areas:

- Project description;
- Project setting;
- Travel demand analysis (including trip generation, roadway level of service (LOS), and distribution);
- Transportation impact analysis (including transit and parking); and
- Appropriate mitigation measures.

Since this project will generate at least 50 peak period trips, a traffic impact evaluation has been prepared.

An LOS analysis has been used to evaluate the impact that construction and operation traffic would have on the area roadways. The LOS is used to describe the flow of traffic along roadways and at intersections. Mitigation measures will be required for those roadways where the project degrades intersections operating at a LOS of A, B, C, or D to E or F. See **TRAFFIC AND TRANSPORTATION Table 1, Level of Service Criteria For Signalized Intersections.**

SETTING

*Mirant Corporation is proposing an expansion of its existing Potrero Power Plant through building Unit 7. Unit 7 will be located in an industrial area along the waterfront in the CCSF on approximately 6.5 acres of the existing 20-acre Potrero Power Plant site, see **TRAFFIC AND TRANSPORTATION Figure 1, Regional Transportation Facilities in the Vicinity of the Potrero Power Plant.** The existing plant site is surrounded by industrial uses on the north, south and west. The eastern boundary is the San Francisco Bay shoreline.*

REGIONAL DESCRIPTION

*Local transportation routes in the area of Unit 7 include freeways, highways, and local roadways. Plant construction and operation traffic will be by existing area roadways. The regional and local roadways in the area that will be most affected by Unit 7 are shown in **TRAFFIC AND TRANSPORTATION Table 2, Characteristics of Roadways In The Area.***

TRAFFIC AND TRANSPORTATION Table 1
Level of Service Criteria For Signalized Intersections

LOS	Description	Vehicle Delay (Seconds)
A	Free flow and insignificant delays.	≤ 5.0
B	Stable operation and minimal delays; many drivers begin to feel somewhat restricted.	>5.0 and ≤ 15.0
C	Stable operation and acceptable delays.	>15.0 and ≤ 25.0
D	Approaching unstable and tolerable delays; vehicle queues may develop but dissipate rapidly,	>25.0 and ≤ 40.0
E	Unstable operation and significant delays; long queues may form upstream from the intersection.	>40.0 and ≤ 60.0
F	Forced flow and excessive delays; vehicle queues may block upstream intersections.	> 60

SOURCE: NATIONAL RESEARCH BOARD, TRANSPORTATION RESEARCH BOARD, Highway Capacity Manual Special Report 209, Third Edition Page 9-6

TRAFFIC AND TRANSPORTATION Table 2
Characteristics of Roadways In The Area

	<i>Classification</i>	<i>Capacity</i>	<i>Average Daily Traffic Volume</i>	<i>Peak Daily Traffic Volume</i>
Regional Roadways				
<i>Interstate 280</i>	<i>Freeway</i>	<i>288,000</i>	<i>156,000</i>	<i>164,000</i>
<i>US 101</i>	<i>Freeway</i>	<i>384,000</i>	<i>252,000</i>	<i>262,000</i>
Local Roadways				
<i>Third Street</i>	<i>Arterial</i>	<i>49,000</i>	<i>21,000</i>	<i>23,100</i>
<i>Evans Avenue</i>	<i>Arterial</i>	<i>32,000</i>	<i>14,600</i>	<i>16,060</i>
<i>Cesar Chavez Street</i>	<i>Arterial</i>	<i>32,000</i>	<i>12,000</i>	<i>13,200</i>
<i>Illinois Street</i>	<i>Collector</i>	<i>12,000</i>	<i>3,400</i>	<i>3,740</i>
<i>Cargo Way</i>	<i>Collector</i>	<i>24,000</i>	<i>8,759</i>	<i>9,635</i>

Source: SECAL 2000a, Table 8.10-1 Page 8.10-29.

General access to the Unit 7 site will be from both Interstate-280 (I-280) and US Highway 101 (US 101). Direct access to the site will be via Illinois and 23rd Street.

FREEWAYS AND HIGHWAYS

Interstate 280

I-280 begins south of San Francisco's Market District and passes approximately five blocks west of Unit 7. I-280 runs south to San Jose and is composed of six to eight lanes of mixed-flow traffic with a daily capacity of 288,000 vehicles in the vicinity of Unit 7. California Department of

TRAFFIC AND TRANSPORTATION Figure 1
Regional Transportation Facilities in the Vicinity of the Potrero Power Plant

Transportation (Caltrans) placed I-280 daily average traffic volume at 156,000 vehicles with a peak daily traffic volume of 164,000 vehicles in 1998. Access to Unit 7 from I-280 would be the 25th Street exit for southbound traffic and the Cesar Chavez/Army Street exit for northbound traffic.

US HIGHWAY 101

US 101 is a north/south freeway located approximately one mile west of the project. US 101 is an eight lane limited access freeway with a capacity of 389,000 vehicles. The Caltrans 1998 traffic counts indicate an average daily traffic volume of 252,000 vehicles with a peak daily traffic volume of 262,000 vehicles. Access to Unit 7 from US 101 would be via the Cesar Chavez/Army Street interchange for both northbound and southbound traffic.

LOCAL ROADWAYS

Access to the project site for construction and operation traffic will be by existing city streets. This network of local roadways is shown in **TRAFFIC AND TRANSPORTATION Table 2, Characteristics Of Roadways In The Area.**

City streets in the area that provide access to Unit 7 are Third Street, Cesar Chavez/Army Street, and 25th Street. Direct access to Unit 7 is by a driveway off of Illinois Street between 22nd and 23rd Streets. This is a dedicated entrance to the project with a gate and guard station to preclude public access.

THIRD STREET

Third Street is a major north south roadway two blocks west of Unit 7. It is a commercial street that provides an access route for industry located along the waterfront area. Third Street is a six-lane arterial with three 10 foot-wide traffic lanes in both directions. The street has a center median, with openings for left turns at intersecting streets such as 22nd and 23rd Streets. Left turn lanes are provided at intersections with other major arterial roadways, but are not provided at minor intersections. On-street parking is normally allowed on both sides of the street. Third Street carries approximately 21,000 vehicles per day.

The San Francisco General Plan designates Third Street as a Major Arterial and Primary Transit Route. The plan also designates Third Street as a Neighborhood Commercial Street and a Citywide Bicycle Route.

CESAR CHAVEZ STREET

Cesar Chavez Street is a major arterial located five blocks south of the project running in an east west direction. Cesar Chavez Street provides access to the project from both I-280 and US 101. This street intersects Third Street from which vehicles traveling to the project site can access the site by turning north on Third Street and proceeding to 23rd Street. Cesar Chavez Street is also a Citywide Bicycle Route.

25TH STREET

25th Street provides access directly to I-280 northbound at either Indiana Street, or via Pennsylvania Avenue to reach the I-280's southbound lanes. For US 101, traffic headed northbound can access the ramp by going westbound on Cesar Chavez Street. Traffic heading southbound on US 101 must turn at Bryant Street and return eastbound along Cesar Chavez Street.

OTHER LOCAL STREETS

Other area roadways that will be impacted by the construction of Unit 7 are 23rd Street, Cargo Way, Evans Avenue, Hunters Point Boulevard, Innes Avenue and Illinois Street. Construction of the proposed Unit 7 underground transmission line will directly impact traffic along the following roadways, Illinois Street, Cargo Way, Jennings Street, Evans Avenue, Hunters Point Boulevard and Innes Avenue.

Traffic control along 23rd Street, Cargo Way and Illinois Street consists of 25 miles per hour posted speed limits, and stop signs. These roadways provide one travel lane in each direction and have on street parking on both sides. Traffic signals exist at the intersections of Third Street and 22nd and 23rd Streets.

Illinois Street has two lanes of travel and parking on both sides of the street. Illinois Street carries approximately 3,400 vehicles per day. Cargo Way carries approximately 8,579 vehicles per day.

Evans Avenue, Hunters Point Boulevard, and Innes Avenue are four-lane arterials running in a generally east-west direction between Cesar Chavez Street and Hunters Point. The two-way average daily traffic on Evans Avenue east of Mendell Street is approximately 14,600 vehicles.

AIRPORT

There are two major airports in the vicinity of Unit 7, San Francisco International Airport and Oakland International Airport. San Francisco International Airport is approximately 15 miles south of Unit 7, and Oakland International Airport is located approximately 10 miles east across San Francisco Bay.

Railroads

The applicant has indicated that the heavy equipment items could be brought to Pier 80 or Pier 96 by rail. The equipment would then be off-loaded and transported to the site by either common carrier or heavy equipment haulers.

Equipment delivered at Pier 80 would take the following route to the plant site: trucks would take Cesar Chavez to Third Street, turning right on 25th, 24th, or 23rd Street and left onto Illinois Street to the site. If the equipment is delivered to Pier 96, trucks would use Cargo Way to Third Street, crossing the Third Street bridge. The trucks would then turn left on 25th, 24th, and 23rd Street and left onto Illinois Street to the site, (SEP2000Dres1, Data Response No. 44).

If equipment cannot be transported by rail to Pier 80 or Pier 96, then delivery would be taken in Oakland and loaded onto barges to be transported across the Bay to either Pier 80 or 96. Once offloaded, the equipment would be moved to the project site by one of the routes outlined above.

PUBLIC TRANSPORTATION

CCSF has several forms of public transportation, including local and regional buses, rail and ferry services. The San Francisco Municipal Railway (MUNI) has several routes in the vicinity of Unit 7. They are routes 9, 15, 22 and 48.

Route 9 extends from Visitacion Valley north to downtown San Francisco. Route 9 connects with Route 22 and Route 48 that travel along Illinois Street north of Unit 7.

Route 15 is the primary line that serves the Central Basin and Hunters Point areas. Route 15 runs along Third Street, which is one block west of the facility.

Route 22 connects from Fillmore and Bay Streets in the Marina district south through Pacific Heights and Mission Dolores before heading southeast to Third Street. The route then returns north at 20th Street, stopping two blocks north of Unit 7.

Route 48 provides cross-town service from the West Portal community to Potrero Hill. This route has a stop at 22nd and Illinois adjacent to the site; it then travels west on 22nd Street with connections to Routes 15 and 9.

MUNI routes that would be directly impacted by the construction would be those located along the route the proposed buried transmission line would follow between Unit 7 and Hunters Point. This would include routes 19 and 44 at the intersection of Jennings/Hunters Point Boulevard.

Caltrain provides commuter rail service between Santa Clara, San Mateo and San Francisco counties. The closest station to Unit 7 is the 22nd Street and Pennsylvania Avenue Station, which is six blocks west of the project.

BICYCLE ROUTES

There are several bicycle routes located along roadways that will be impacted by the project. Both Third Street and Cesar Chavez Street function as city bicycle routes.

SITE AND VICINITY DESCRIPTION

LINEAR FACILITIES

Potentially affected roadways are those adjacent to or crossed by the proposed project linear components (i.e. transmission line, natural gas pipeline, water supply and wastewater pipelines).

TRANSMISSION LINE

Construction of Unit 7 will result in two points of interconnection to the Pacific Gas and Electric (PG&E) system. The connections will be at the Potrero and Hunters Point Substations. PG&E's Potrero Substation is located directly adjacent to the proposed Unit 7. The transmission interconnection to the existing Potrero substation will occur via overhead transmission lines. Therefore, no roadways will be impacted by the construction of the Potrero Substation transmission connection.

The transmission line connection to the PG&E Hunters Point Substation will be via underground cables that will be buried within road rights of way. The Hunters Point switchyard is approximately 1.8 miles from the proposed location for Unit 7. Traffic and property accessibility along the underground transmission route will be impacted by this construction.

NATURAL GAS PIPELINE

The natural gas fuel supply for the Potrero Power Plant is via a 24-inch gas line from PG&E San Francisco Center. At Mirant's request PG&E evaluated its ability to supply the Potrero facility after Unit 7 was installed. PG&E indicated that the current natural gas connection would be capable of supplying both Unit 3 and Unit 7 requirements (CCSF 2000Dreq1. Data response No. 23). Therefore, the Hunters Point power plant will not have to be taken out of service for natural gas to be supplied to Unit 7 as originally indicated in the AFC. Unit 7 will not require the construction of a natural gas fuel supply pipeline, therefore there will be no impact on traffic.

WATER SUPPLY LINE

There will be no offsite construction for linears associated with the water supply for the plant, therefore no roadways will be impacted.

WASTEWATER DISCHARGE

Depending upon the use of water, wastewater will be disposed in one of two ways, either to the San Francisco Bay or the city sewer system. Unit 7 will not require the construction of site wastewater discharge pipelines. Therefore, there will be no impact on traffic for wastewater pipelines.

COOLING WATER SUPPLY SYSTEM

The existing Unit 3 along with the new Unit 7 will use a steam cycle that requires the circulation of cooling water. The Potrero PP will utilize seawater drawn from San Francisco Bay through an intake structure on the Potrero PP waterfront. After the cooling water passes through the condenser it will be discharged to the Bay through offshore diffusers. The diffusers are four pipelines that extend approximately 900 feet into the Bay. The diffuser pipes will be laid directly in the bay bottom and at approximately 70-foot intervals a 6-inch thick concrete grout mattress will be laid over each pipeline. To provide a smooth transition to the diffuser portion of the discharge, some trenching may be required.

ACCESS ROUTES

Because Unit 7 is an addition to the presently operating Potrero facility, land access to the power plant will be by the existing access roads located on the southern and western sides of the site. Direct access for the site is provided by Illinois Street and 23rd Street, with general access to the site vicinity via I- 280. There will be no traffic impact for access road construction.

Marine access for the barges related to construction of the water intake and outflow diffusers will be via normal shipping channels in the San Francisco Bay. If any of the barges or vessels associated with the construction of the cooling water intake and outtake system must anchor or moor in any manner other than to an existing approved dock or pier then they could create a hazard to shipping in the Bay.

IMPACTS

The California Environmental Quality Act (CEQA) indicates that a project could have a significant effect on traffic and transportation if the project will:

- Cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the highway and road system (i.e. result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections).
- Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses.
- Result in inadequate parking capacity.

POWER PLANT

CONSTRUCTION PHASE

The primary traffic impact of Unit 7 expansion will be during the construction phase. During construction, the number of trips generated by the site will increase significantly due to construction workers and construction-related deliveries of equipment and material. To evaluate the impact of construction traffic, the impacts on the area roadways and intersections were analyzed using the current traffic counts and the estimated traffic generated during the peak construction phase.

COMMUTER TRAFFIC

During the peak construction months (months 12 through 17), an average of 279 workers are expected to access the site daily. It was assumed that 1.5 percent of the workers would use the CCSF transit system, thereby resulting in 275

construction worker trips. If each of these workers drives to the site, this will result in 275 daily inbound and 275 outbound commute trips. It was assumed that the majority of workers coming to the plant would use surface streets. The greatest impact of the commuter traffic would be on Third Street. The vehicle trips were assumed to be distributed in the following manner, 20 percent of the trips are assumed to arrive from southbound US 101 while the remainder would use surface streets and be split evenly between the north and south (SECAL 2000a, AFC page 8.10-14).

TRUCK TRAFFIC

There are streets within the vicinity of Unit 7 that have vehicle weight restrictions. Palou, Quesada, Revere, Shafter, and Thomas Avenues prohibit vehicles with weight greater than 6,000 pounds. Truck weights greater than 11,000 pounds are prohibited south of the Unit 7 construction area on Third Street between Evans Avenue and Carroll Avenue. Between Jameston Avenue and Jerrold Avenue through truck traffic is not allowed on Third Street (SECAL 2000a, AFC page 8-10.10).

Construction of the generating plant will require the use and installation of heavy equipment and associated systems and structures that will be delivered by truck. Heavy equipment will be used throughout the construction period, including trenching and earthmoving equipment, forklifts, cranes, cement mixers and drilling equipment. In addition to deliveries of heavy equipment, construction materials such as concrete, wire, pipe, cable, fuels and reinforcing steel will be delivered to the site by truck. Deliveries will also include hazardous materials to be used during construction, such as gasoline, diesel fuel, motor oil, hydraulic fluid, various lubricants, solvents, cleaners, sealers, welding flux, and paint materials.

A majority of the equipment and materials will be transported from the San Francisco area and come to the plant site by way of I-280 and US 101. Trucks traveling southbound on I-280 would exit at 25th street while those traveling northbound would exit on Cesar Chavez/Army Street. Trucks using US 101 would exit at Cesar Chavez/Army Street. This would be for both north and southbound travel.

Once on surface streets, the truck would turn north on Third Street and then right on 23rd Street to the plant site.

During the peak construction months (months 15 through 20) the maximum daily trips will consist of 10 delivery trucks and 15 heavy vehicles and trucks for a maximum of 25 truck trips per day.

Total Project Construction Traffic

The total maximum daily vehicle trips to Unit 7 during its peak construction months would be approximately 300 (275 worker and 25 truck trips). This would result in the generation of 600 total daily project trips (see **TRAFFIC AND TRANSPORTATION Table 3 below**).

As can be seen in **TRAFFIC AND TRANSPORTATION Table 4, Percent of Capacity Used on Local Roadways** below, the roadways in the area of the project will be able to handle the additional vehicle trips generated by the project.

TRAFFIC AND TRANSPORTATION Table 3
Daily Trip Generation for Unit 7 at Peat of Construction Schedule

Vehicle Type	Maximum Project Population	Estimated Mode Split	Daily One-Way Trips	Maximum Daily Trips
Construction Personnel	279	1.5%(1)	275	550
Delivery Trucks	N/A	N/A	10	20
Heavy Vehicles and Trucks	N/A	N/A	15	30
Total	279		300	600

(1) Korve Engineering estimates for Daily One-Way Trips assume a minor Construction Personnel mode split of 1.5% in San Francisco where transit use for construction employees is common and often at much higher levels.

Source: SEP2000DRes1, Data Response No. 44 Table 8.10-5

TRAFFIC AND TRANSPORTATION Table 4
Percent of Capacity Used on Local Roadways

	Capacity	Average Daily Traffic Volume	Percent of Capacity	Peak Daily Traffic Volume	Percent of Capacity
Regional Roadways					
<i>Interstate 280</i>	288,000	156,000	54.2 %	164,000	56.9 %
<i>U.S. 101</i>	384,000	252,000	65.6 %	262,000	68.2 %
Local Roadways					
<i>Third Street</i>	49,000	21,000	42.9 %	23,100	47.1 %
<i>Evans Avenue</i>	32,000	14,600	45.6 %	16,060	50.2 %
<i>Cesar Chavez Street</i>	32,000	12,000	37.5 %	13,200	41.3 %
<i>Illinois Street</i>	12,000	3,400	33.3 %	3,740	21.2 %
<i>Cargo Way</i>	24,000	8,759	36.5 %	9,635	40.1 %

Source: Percent of Capacity calculated from capacity data in **Traffic and Transportation Table 2.**

Intersection Operating Conditions

The ability of a roadway to handle traffic is referred to as capacity. The capacity for a roadway is normally greater between intersections and less at intersections because the traffic flows continuously between them and only during the green phase at the intersection.

The present percent of roadway capacity for the average daily traffic volume and during the peak daily traffic hour indicates that the roadways have the ability carry the additional 600 daily trips without causing a significant impact.

The location of Unit 7 will result in the majority of construction related traffic using the local roadways. A small amount of equipment and materials may be delivered by rail or barge. Therefore, the capacity at the major intersections impacted by this

traffic will determine if acceptable operating levels are maintained. The intersections in the area are presently operating at a LOS of C or better during the morning and evening peak periods (see **TRAFFIC AND TRANSPORTATION Table 5, below**).

TRAFFIC AND TRANSPORTATION Table 5
Level of Service for Existing and Existing Plus Project Conditions

Intersection	Peak Hour	Existing		Existing Plus Project	
		LOS	Delay (1)	LOS	Delay (1)
Third Street and 16 th Street	a.m.	B	6.4	B	6.5
	p.m.	B	12.7	B	12.5 (2)
Third Street and 20 th Street	a.m.	A	4.4	A	4.4
	p.m.	A	4.3	A	4.3
Third Street and 25 th Street	a.m.	A	4.8	A	4.7 (2)
	p.m.	A	4.6	A	4.6 (2)
Third Street and Cesar Chavez Street	a.m.	B	13.8	B	13.7 (2)
	p.m.	B	12.9	B	12.8 (2)
Third Street and Evans Avenue	a.m.	C	15.2	C	15.2
	p.m.	C	15.6	C	15.5 (2)
Cesar Chavez Street and Evans Avenue	a.m.	C	21.3	C	21.4
	p.m.	C	24.8	C	24.9

(1) Average Intersection Delay in seconds per vehicle.

(2) Based on the 1994 Highway Capacity Manual methodology: the average stopped/delayed vehicle is estimated for each lane group and average for approaches and the intersection as a whole. Some increases in volume for a non-critical movement may cause a slight decrease in the overall intersection delay. That is the case of the existing conditions plus project scenario for the four intersections at the peak hours indicated.

Source: SEP2000DRes1, Data Response No. 42 Table 8.10-6

Although the increase in construction traffic did not change the LOS for the intersections reviewed, mitigation has been proposed to minimize the impact. Therefore, the impact of construction traffic on local intersections identified in Table 5 is not considered to be significant.

OPERATIONAL PHASE

COMMUTE TRAFFIC

Upon completion of the construction for facility expansion, operations will require approximately 10 additional permanent employees. This increase in operating employees will not result in significant traffic impacts for area roadways or intersections.

TRUCK TRAFFIC

Transportation and handling of hazardous substances associated with Unit 7 could result in increased roadway hazard potential. The major volume of hazardous material that will be used by the facility will be aqueous ammonia.

The project will result in approximately one delivery every five days (SECAL 2000a, AFC page 2-19-6). Hazardous material being transported to the site will use I-280 or US 101. Trucks using either I-280 or US 101 would exit at Cesar Chavez. The trucks could then proceed east along Cesar Chavez/Army Street to Third Street. The trucks would turn left on Third Street to 22nd Street. The trucks would then turn right on 22nd Street and proceed to the plant site at 22nd and Illinois Streets (SEP2000Dres1, Data Response No. 43).

Another possible route for the trucks using either I-280 or US 101 would be to exit at Cesar Chavez. The trucks would then proceed east along Cesar Chavez/Army Street to Third Street. The trucks would proceed on Third Street to 25th Street where they would make a right turn. They would then go one block on 25th Street turning left on Illinois Street. Once on Illinois Street the trucks would proceed to the plant site at 22nd and Illinois Streets (SEP2000Dres1, Data Response No. 43).

Staff reviewed these routes during a field visit and did not find any unusual hazards to trucks transporting hazardous materials. To further ensure the safe delivery of ammonia to the facility, Mirant has indicated that they would retain the services of a licensed ammonia supply contractor that meets all of the following criteria (CCSF 2000Dreq1, Data Response No. 35):

- Truck design will be consistent with the Department of Transportation and California Highway Patrol requirements for transportation of hazardous materials.
- Drivers will be trained in hazardous material handling and emergency response procedures.
- Drivers will maintain radio and telephone communication and are trained to coordinate initial evacuation efforts, if needed, and to contact the appropriate emergency response agencies in the event of a release during transit.

Airport Traffic

Operations at the San Francisco International Airport and Oakland International Airport could be affected by the addition of two exhaust stacks associated with Unit 7. The two stacks will have an elevation of 205 feet above sea level; so review by the Federal Aviation Administration (FAA) will be required to determine if the stacks could result in possible obstructions to navigable airspace. The applicant intends to notify the FAA about the construction of the stacks for Unit 7 using FAA Form 7460-1, Notice of proposed Construction or Alteration (SEP2000DRes1, Data Response No. 45).

If the FAA determines that the stacks could be an obstruction in navigable air space, the project would be required to light and mark the stacks as required by FAA regulations and specifications. The FAA lighting and marking standards are set forth in the FAA Advisory Circular AC 70/7460-1, "Obstruction Marking and Lighting".

Mirant has indicated that they will light and mark the stacks in accordance with FAA regulations and specifications. If this is done, the stacks will not have a significant impact on air traffic. Staff has proposed a condition of certification to require compliance with FAA stack marking and lighting requirements.

LINEAR FACILITIES

Potentially affected roadways are those adjacent to or crossed by the proposed project liner components (i.e., transmission line, natural gas pipeline, and water supply and wastewater pipelines). The only off-site construction of linears will be the underground transmission line connecting Unit 7 to the Hunters Point Substation.

Construction Phase

Transmission Line

The proposed underground transmission line that connecting Unit 7 to the Hunters Point Substation would be approximately 1.8 miles long. This underground transmission line would exit Unit 7 at the corner of Illinois Avenue and 23rd Street and proceed south to the end of Illinois Street. From this point it would continue south following an abandoned rail right-of-way to Islais Creek. Directional boring would be used to run the line under Islais Creek where it will continue along the rail right-of-way to Cargo Way. It would then run southeast along Cargo Way to Jennings Street. The underground line would then go down Jennings Street to Evans Avenue and would turn left onto Hunters Point Boulevard and continue to the Hunters Point Substation.

None of the MUNI routes are located along the route chosen for the underground cable. But, at the intersection of Evans Avenue and Jennings Street, MUNI routes 19 and 44 could be impacted, as construction at this intersection will be required for the cable route to continue to the Hunters Point Substation.

The underground cable construction could impact the street located along the route by:

- Increasing vehicle trips caused by construction workers and construction vehicles.
- Disrupt existing vehicle and bicycle traffic.
- Limiting access to properties located along the cable route.

- Delaying local transit service.
- Increasing potential traffic safety hazards to motorists, bicyclists, pedestrians, and construction workers.
- Reducing the available parking along the route during construction.

Construction of the offsite underground transmission line is scheduled to take four months and would require approximately 41 workers. The timing for the construction of the underground cable has not been set. In selecting the construction timing the applicant has indicated that they will take into account minimizing the overall construction disturbance to the community, availability of contractors, and city approval for scheduling work in street rights of way (SEP2000DRes1, Data Response No. 41).

The construction of the underground transmission line has the potential to significantly disrupt existing traffic operations at different points along its 1.8-mile route during the four-month construction period. But if mitigation measures are applied during lane closures and the crossing of intersections for the protection of workers, traffic, bicyclists and pedestrians, the impact of the construction can be reduced to less than significant (see the Mitigation Section).

Circulating Cooling Water Supply

If barges and vessels used for the construction of the circulating Cooling Water Supply system must anchor or moor in a manner other than to an existing approved dock or pier, they could create a safety hazard to shipping traffic. If the construction barges or vessels must anchor or moor for construction activity away from an approved dock or pier, then they must obtain a waiver from the U.S. Coast Guard Marine Safety Office San Francisco Bay. If this is done, then the Coast Guard will be able to inform barges and vessels operating in the area such that impacts on Bay shipping traffic will be insignificant (see the Mitigation section).

Operation Phase

Traffic should experience no operational impact from the underground line connecting Unit 7 to the Hunters Point Substation once construction is complete. Therefore traffic impacts associated with the operation of the underground cable is insignificant.

CUMULATIVE IMPACTS

Other traffic related projects in the area include the San Francisco Municipal (MUNI) Third Street Light Rail project and the City/County of San Francisco Illinois Street Rail-Truck Bridge.

MUNI, the City of San Francisco, and San Francisco County Transportation Authority will commence construction of the Third Street Light Rail project in 2001. This project is to be done in two phases. The construction of the first phase of this

light rail project will last approximately three years. It will extend light rail service south from the current terminal at Fourth and King Street. The line will cross the Fourth Street bridge and run along Third Street and Bayshore Boulevard to the Bayshore CalTrain Station in Visitation Valley. The first phase is expected to open for service in 2004 (MUNI 2001a).

The Third Street Light Rail Project also includes the construction of a facility for storage, maintenance, and operation of MUNI's light rail vehicles. The site is to be located south of the Potrero project on a site bounded by 25th Street, Illinois Street, Cesar Chavez Street and Louisiana Street for a total of 13 acres. The construction of the light rail yard and shops is scheduled to begin December of 2001 with the anticipated completion in April 2004 (MUNI.2001b).

Third Street is located one block west of Unit 7 running in a north/south direction. This portion of Third Street is included in MUNI Phase 1 construction plans. The MUNI Light Rail Facility will be located approximately two blocks south of the Potrero project. MUNI's construction along with Unit 7's construction activity could result in additional traffic congestion for the area. The construction schedule for the MUNI project will be available before the Final Staff Assessment is issued, and if necessary, mitigation measures will be proposed to minimize the impact that both projects will have on local traffic.

The other project located south of the Potrero PP involves the construction of an Illinois Street Rail-Truck Bridge. This will be an intermodal bridge to improve traffic flow to the Port's lands located on the north side of the Islais Creek Channel. Construction for the bridge is planned for the latter part of 2003.

The parties involved in all three projects (i.e. MUNI Third Street Light Rail Facility, Illinois Street Rail-Truck Bridge, and the Potrero PP) will need to coordinate their respective construction schedules to avoid unnecessary traffic delays. The need for coordination is reflected in proposed condition of certification **TRANS-5**.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

The applicant has stated its intention to comply with all federal LORS. Staff has proposed a condition of certification to ensure compliance. Staff believes such compliance will not present any unusual difficulties. The project is considered consistent with identified federal LORS.

STATE

The applicant has stated its intention to comply with all state LORS. Staff has proposed a condition of certification to ensure compliance. Staff believes such compliance will not present any unusual difficulties. The project is considered consistent with identified state LORS.

LOCAL

The applicant has indicated their intent to comply with the goals and policies of the City/county of San Francisco. This would include transportation and traffic system requirements during construction and operation. The project is considered consistent with identified county and local LORS.

FACILITY CLOSURE

INTRODUCTION

There are at least three circumstances in which a facility closure can take place, planned closure, unexpected temporary closure and unexpected permanent closure.

PLANNED CLOSURE

Planned closure occurs when the facility is closed in an anticipated, orderly manner at the end of its useful economic or mechanical life, or due to gradual obsolescence. To insure that the planned closure will be completed in a manner that complies with all LORS, the project owner will prepare a Facility Closure Plan for submittal to the California Energy Commission for review and approval at least twelve months prior to the proposed closure. At the time of closure, all then-applicable LORS will be identified and the closure plan will address how these LORS will be complied with.

UNEXPECTED TEMPORARY CLOSURE

Unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as:

- Disruptions in the natural gas fuel supply.
- Damage to the plant from earthquake, fire, storm or other natural disasters.
- The project owner's decision not to operate the facility for a period of time due to economic or other reasons.

From the perspective of traffic and transportation issues, in the event of temporary facility closure, the applicant would have to comply with all applicable policies contained in the LORS section of this report with respect to transportation permits for hazardous materials and equipment deliveries and removal.

UNEXPECTED PERMANENT CLOSURE

Unexpected permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly on a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. Staff assumes that the facility will either remain idle until such time that

new ownership is established, or dismantling of the facility will occur. In any event, the owner will have to secure applicable transportation permits to satisfy the LORS requirements as stated in this report.

In the event of temporary closure, the effects on traffic and transportation would be similar to those for normal operation of the power plant facility. In the event of permanent closure, the effects would be similar to those associated with project construction. Staff will evaluate for potential impacts and possible, mitigation for a permanent closure upon notification that such a closure will occur.

MITIGATION

The applicant has indicated its intention to comply with all LORS relating to: 1) the transport of oversized loads, 2) the transport of hazardous materials and 3) implementation of Traffic Control Programs (TCP) for various roadways when construction impedes the flow of traffic. The applicant has proposed to implement the following mitigation measures.

Mitigation measures to reduce the disruption of vehicular, bicycle, and pedestrian traffic operations during underground cable construction.

- For Hunters Point Boulevard, the lane closure strategy would follow Caltrans' traffic control system for lane closure of multilane conventional highways. This would also include the necessary sign installations, cones for lane closure and other applicable requirements that are set forth in the CCSF Department of Parking and Traffic manual, entitled Regulations for Working in San Francisco Streets.
- For Hunters Point Boulevard, northbound bicycle traffic will be given the right-of-way with protected movement along the portion of roadway undergoing construction activity, while traffic is stopped at both ends by flagmen. This will ensure additional safety to bicyclists. Depending on the volume of bicycle traffic, the delays experienced by stopped traffic on Hunters Point Boulevard would be infrequent.
- For two lane roadways, such as Illinois and Jennings Streets, the lane closure plan would follow Caltrans' traffic control system for lane closure on two lane conventional highways. This would also include the necessary traffic control devices, flagmen, a pilot car, if required, and other applicable requirements that are set forth in the CCSF Department of Parking and Traffic manual entitled Regulations for Working in San Francisco Streets.
- For locations where the installation of the underground transmission cable will be in narrow roadways, the applicant will make certain that encroachment does not occur beyond the roadway centerline. This will ensure that a minimum of one lane/one half of the roadway is available for traffic to pass.

- For Cargo Way, which is median-divided, if at least one lane westbound cannot remain open during construction, the applicant will implement a traffic control strategy that will require the use of both lanes in the eastbound direction (on the south side) to carry bi-directional traffic. If required, the applicant will use flaggers to monitor and control traffic, especially in the event of wide and slow turning trucks into and out of adjacent driveways. Detours will be implemented, if required, for non-local/through traffic to use Third Street and Evans Avenue rather than Cargo Way.
- For the crossing of intersections by trenches, advance notification, in the form of roadside signs, will be provided to the driving public indicating that the intersection in question will be temporarily closed to traffic. The signage will include information such as the anticipated time frame/duration of closure, and the times of day of closure, if only certain hours apply. Detour signs will be provided if necessary to reroute traffic.
- After the transmission line trench has been backfilled, but before the pavement is restored, the applicant shall instruct the contractor to use steel plates to cover the exposed areas, if necessary, to allow the lane to be opened to traffic. The applicant will also comply with any additional requirement contained in the CCSF Department of Public Works manual entitled Regulation for Excavating and Restoring Streets in San Francisco while working in roadways.

Mitigation measures to reduce the obstruction of access to adjacent land use during underground cable construction.

- In situations involving temporary obstruction of access to adjacent properties, the applicant or its agent will coordinate directly with the affected property owners prior to starting construction to work out feasible and mutually convenient dates and times during which construction could take place.
- Proper advance notification will be provided to property owners to be affected, as soon as possible after certification, and then followed up by periodic updates as to when the anticipated date of driveway obstruction is likely to occur based upon progress of the project.
- For high activity centers, such as the US Postal Service facility located on the south side of Cargo Way adequate notification will be provided. The applicant, owners or their representative will coordinate with the contractor to develop temporary access schemes for various stages of construction whereby these facilities can continue to operate with minimal disruption.

Mitigation measures to reduce traffic hazards to motorists, bicyclists, pedestrians and construction workers during underground cable construction.

- The applicant will see that lower speed limits are implemented throughout the construction/work zones and will utilize the presence of law enforcement, if necessary, to ensure that motorists obey the reduced speed limits.
- The applicant will ensure that adequate signage and appropriate traffic control devices are provided and installed in the proper locations to warn motorists of the impending construction activity within or near the roadway, as required under the CCSF Department of Public Works manual entitled Regulation for Excavating and Restoring Streets in San Francisco.
- The applicant will insure that its contractors provide adequate illumination of the work zone during conditions of limited visibility such as during inclement weather.
- Construction personnel will be required to wear reflectorized clothing/vests to ensure visibility by motorists.
- If necessary, work will be restricted to off peak hours so that the potential for conflict with greater traffic volumes is minimized.
- The applicant will ensure that construction safety practices are observed.
- In the case of a sidewalk becoming occupied by the work area, or if it is immediately adjacent to the work area, a temporary pedestrian walkway with a “canopy-type” protected zone will be constructed to maintain accessibility through the area, and to protect pedestrians from the construction activities.
- Signs will be placed along affected parking areas well in advance to warn motorists that the parking lane will be closed between certain dates.
- The applicant will coordinate with the US Postal Service facility to determine where their parked trailers can be relocated while construction work continues along sections of Cargo Way and Jennings Street. Assuming that two trench excavations are ongoing and they will occupy 200 feet each, only about five to six trailers would be affected on a given day.

STAFF’S PROPOSED MITIGATION

Staff proposes additional mitigation measures to address Unit 7’s construction and trenching operation for laying the underground transmission line and for the construction of the cooling water intake and discharge structures.

- Develop a Traffic Control Plan (TCP) in consultation with the CCSF Department of Parking and Traffic, Caltrans, and other affected parties to ensure that the project will minimize its impact on traffic and to ensure safe roadway conditions.

- Provide MUNI information a minimum of seven days in advance regarding routes and rider stops that will be impacted by the construction of the underground transmission line.
- Coordinate construction activities with MUNI's Third Street light rail construction project and the Illinois Street Rail-Truck Bridge in order to develop a schedule to minimize the impact of these construction projects on the area roadways.
- Develop a roadway maintenance and repair mitigation plan with the CCSF to minimize roadway trenching or construction activities that result in accelerated road wear or other roadway damage as a result of the project construction, and to describe various repairs that will be accomplished as appropriate.
- The applicant will inform and coordinate the construction activity with the U.S. Coast Guard, Water Management Branch if it must anchor or moor any barges or vessels associated with the project in any manner other than to an existing approved dock or pier. This will include a letter to the Commanding Officer of the U.S. Coast Guard Marine Safety Office San Francisco Bay, Attention Water Management Branch, Coast Guard Island, Building 14, Alameda, California 94501-5100. This letter will include:
 1. A full description of the existing conditions/situation, to be followed up with a detail drawing of the area showing large and small scale coverage, in the drawing it should also show the location of equipment and resources clearly marked and spelled out and well defined.
 2. A statement and similar description on the work to be done and why.
 3. A time schedule as to when work will start (Date and Time), how many hours a day operations will be conducted and an estimated date and time of project completion.
 4. Listing of all persons involved in the operation, their title and job description (Person in Charge of operations or Operations Manager, Site Manager) and information on how to contact this person and their availability.
 5. A barge break away contingency plan.
 6. Listing of on-site communication cellular phone numbers and radio frequencies that are monitored. (Must be VHF-FM Marine Channels 14 and 13)
 7. A listing of all companies, agencies and groups involved in operation.

CONCLUSIONS AND RECOMMENDATIONS

POWER PLANT

1. The construction phase will cause increased roadway demand resulting from the daily movement of workers and materials. This will result in traffic increases but will not result in the LOS rating for various roadways to decrease below LOS thresholds established by local and regional authorities.
2. During the construction phase, increased commuter traffic caused by the workforce could result in some traffic congestion. Unit 7 has proposed ways to reduce the impact of construction activity on traffic.
3. During the operational phase, increased roadway demand resulting from the daily movement of workers and materials will be minimal.
4. All transportation and handling of hazardous substances can be mitigated to insignificance by compliance with federal and state standards established to regulate such substances. There are not unusual hazards on the routes that will be used by trucks delivering aqueous ammonia.
5. The construction activity by Potrero PP will need to be coordinated with the construction activities of MUNI's Third Street Light Rail project and the CCSF Illinois Street Rail-Truck Bridge. Coordination of the construction activity between the Potrero PP and the projects will minimize the cumulative impact on area roadways. Further details of the level of impact will be provided in the Final Staff Assessment (FSA) when more detailed construction schedules are anticipated to be available.

LINEAR FACILITIES

1. Construction of the underground transmission line could cause a temporary but significant impact on the function of area roadways. Routine construction safety and the proposed mitigation measures are expected to reduce these impacts to less than significant.

Therefore, staff concludes that there could be some significant adverse impacts in the area of traffic and transportation as a result of the Unit 7-expansion project, but with adoption of staff's proposed conditions of certification these impacts will be reduced to less than significant.

CONDITIONS OF CERTIFICATION

- TRANS-1** The project owner shall comply with Caltrans, and the City and County of San Francisco's limitation on vehicle sizes and weights. In addition, the project owner or its contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions for roadway use.

Verification: In the Monthly Compliance Reports, the project owner shall submit copies of any oversize and overweight transportation permits received during that reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

TRANS-2 The project owner or its contractor shall comply with Caltrans and the City and County of San Francisco's limitations on encroachment into public rights-of-way, and shall obtain the necessary encroachment permits from all relevant jurisdictions.

Verification: In Monthly Compliance Reports, the project owner shall submit copies of any encroachment permits received during the reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

TRANS-3 The project owner shall ensure that permits and/or licenses are secured from the California Highway Patrol and Caltrans for the transport of hazardous materials.

Verification: The project owner shall include in a Monthly or Annual Compliance Report, copies of all permits/licenses acquired by the project owner and/or subcontractors concerning the transport of hazardous substances.

TRANS-4 Prior to the start of construction activity in the Bay, the project owner shall ensure that the U.S. Coast Guard Marine Safety Office is informed about its construction activity in the Bay, and shall obtain the necessary anchorage waiver.

Verification: The project owner shall include in the Monthly Compliance Report, copies of all correspondence with the U.S. Coast Guard and copies of anchorage waivers received for work to be conducted in the Bay.

TRANS-5 Prior to the start of demolition, the project owner shall consult with Caltrans, the City and County of San Francisco, San Francisco Municipal Railway (MUNI), and other impacted parties and prepare and submit to the Compliance Project Manager (CPM) a construction traffic control plan and implementation program. The project owner will coordinate the construction traffic control plan for the plant and its related linears with MUNI's Third Street Light Rail development and the City's Illinois Street Rail-Truck Bridge project.

Protocol: The traffic control plan and implementation program will address:

- Encourage carpools, vanpooling or other ride share programs where appropriate;
- Determine if construction work hours need to be established outside of peak traffic periods;
- Timing of heavy equipment and building materials deliveries;
- Temporary lane closures during construction;
- Redirecting traffic with a flagperson;
- Signing, lighting, and traffic control device placement if required;
- Maintain access to adjacent residential and commercial property during construction;
- Insure that construction doesn't interfere with emergency access;
- Minimize the impact on public transportation; and
- Other issues that may be required to reduce the impact of construction traffic and to ensure safe traffic conditions for the public and construction workers.

Verification: At least thirty days prior to start of demolition, the project owner shall provide to the CPM for review and approval and to MUNI and the City/County of San Francisco for review and comment, a copy of its construction traffic control plan and implementation program. The construction traffic control plan and implementation program must include all appropriate requirements from the City/County of San Francisco Department of Planning and Traffic, Regulations For Working In San Francisco Street. The submittal to the CPM shall provide a copy of MUNI's and the City/County of San Francisco's comments on the plan.

TRANS-6 Following completion of project construction of the power plant expansion and the associated facilities, the project owner shall meet with the CPM and the City/County of San Francisco to determine the action necessary and schedule to complete the repair of all surface streets used for project construction to original or as near original condition as possible.

Protocol: Prior to the start of demolition or earth moving activities, the project owner shall photograph the impacted roadway segments. The project owner shall provide the Energy Commission CPM, City and County of San Francisco, and Caltrans, if necessary, with copies of these photographs. Prior to start of demolition the project owner shall also notify the City and County of San Francisco, and Caltrans about the schedule for project construction. The purpose of this notification is to postpone any planned

roadway resurfacing and/or improvement projects as appropriate until after the project construction has taken place and to coordinate construction related activities associated with other projects.

Verification: Within 30 days after completion of project construction, the project owner shall meet with the CPM, the City and County of San Francisco to determine and receive approval for the actions necessary and schedule to complete the repair of identified sections of public roadways to original or as near original condition as possible. The project owner shall provide to the CPM a letter from the City and County of San Francisco stating their satisfaction with the road improvements upon completion of repairs.

TRANS-7 During construction of the expanded power plant and all related facilities, the project owner shall enforce a policy that all project related parking occurs in designated parking areas.

Verification: At least sixty days prior to start of demolition or earth moving activities, the project owner shall submit a parking and staging plan for all phases of project construction to the City and County of San Francisco for review and comment. The City and County of San Francisco comments and the parking and staging plan will then be forwarded to the CPM for review and approval.

TRANS-8 The project owner shall ensure that the exhaust stacks are marked and lighted required by the FAA so that the stacks do not create a hazard to air navigation.

Protocol: Prior to start of grading for development of Unit 7, the project owner shall have submitted to the Federal Aviation Authority Form 7460-1, Notice of Proposed Construction or Alteration.

Verification: At least thirty days prior to start of demolition or earth moving activities, the project owner shall provide a copy of the FAA Form 7460-1 filed with the regional FAA office to the CPM. At least thirty days prior to erection of the stacks, the project owner shall provide the CPM and the City/County of San Francisco with copies of the FAA response to Form 7460-1 and supporting documents on how the project plans to comply with any stack lighting and marking requirements imposed by the FAA.

REFERENCES

SECAL (Southern Energy California). 2000a. Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission May 31.

Sep (Southern Energy Potrero LLC). SEP2000Res1. Southern Energy Potrero LLC (SEP) response to staff Data requests, Set 1, Potrero Power Plant Unit 7

Project (00-AFC-4). Submitted to California Energy Commission October 7, 2000

CCSF (City and County of San Francisco). CCSF2000DReq1. City/county of San Francisco, Data Request Nos. 1 through 100, Petrero Power Plant Unit 7 Project (00-AFC-4). Submitted to Southern Energy California, November 17.

Bowman. 2001. Mary Beth Bowman Telephone Conversation with James Fore California Energy Commission. .
MUNI Construction. January 23, 2001.

CCSF (City and County of San Francisco). 1997. Department of Parking and Traffic. Regulations For Working In San Francisco Streets, Fifth Edition. October 1997.

NRC (National Research Council). 1994, Transportation Research Board, 1994. Highway Capacity Manual, Special Report 209, Third Edition, 1994.

MUNI 2001a (San Francisco Municipal Railway) 3rd Street Light Rail Project, Overview: The Project in a Nutshell, Web Site
www.sfmuni.com/aboutmun/3rdover.htm.

MUNI 2001b. (San Francisco Municipal Railroad). Third Street Light Rail Connection. Project Update Bulletin. March. 2001.

TRANSMISSION LINE SAFETY AND NUISANCE

Obed Odoemelum, Ph.D.

INTRODUCTION

Electrical energy from the proposed Potrero Power Plant Unit 7 (Unit 7 or “the project”) will be delivered to the Pacific Gas and Electric (PG&E) 115 kV transmission system through two separate interconnection points at (1) the existing PG&E 115 kV Potrero Substation located directly adjacent to the Potrero Power Plant and, (2) the existing PG&E Hunters Point Substation approximately 1.8 miles to the south of the project site. As detailed by the applicant, Mirant Potrero, LLC (Mirant, formerly Southern Energy Potrero, LLC), the connection to the on-site Potrero Substation will be through an overhead, single-circuit 115 kV line approximately 400 feet long and located entirely within the existing Potrero Power Plant property lines (2000a, pages 2-5 through 2-7, 2-21 through 2-23, 5-1, and Appendices C and E3.) The interconnection to the Hunters Point Substation will be through two double-circuit 115 kV lines to be located underground as required by the City and County of San Francisco for such utility lines. These two new underground circuits will be necessary because the existing Potrero Substation does not have enough transmission capacity to accommodate all the new power from Unit 7. The connection to the PG&E Potrero Substation will necessitate construction of a new on-site switchyard to the east of the substation. This switchyard will be designed to accommodate power transmission for both Unit 7 and the existing Units 3 through 6 of Potrero Power Plant.

The purpose of this staff analysis is to assess the proposed line construction and operational plans for incorporation of the measures necessary for compliance with all applicable laws, ordinances, regulations and standards (LORS). If such compliance is established for both the overhead and underground sections, staff will recommend approval with respect to the issues of concern in this analysis; if not, staff will recommend project revisions as appropriate.

Staff’s analysis will focus on the following issues as related primarily to the physical presence of the lines or secondarily to the physical interactions of their electric and magnetic fields:

- Aviation safety;
- Interference with radio-frequency communication;
- Audible noise;
- Fire hazards;
- Hazardous shocks;
- Nuisance shocks; and
- Electric and magnetic field (EMF) exposure.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Discussed below by subject area are design-related LORS applicable to the physical impacts of the overhead and underground transmission lines as proposed for Unit 7. The potential for these impacts is assessed in terms of compliance with specific federal or state regulations or established industry standards and practices. There presently are no local laws or regulations specifically aimed at the physical structure or dimensions of electric power lines to limit the impacts noted above. However, many local agencies such as the City and County of San Francisco (CCSF) require that such lines be located underground in their areas of jurisdiction mainly because of the potential for visual impacts on the city landscape.

AVIATION SAFETY

Any hazard to area aircraft relates to the potential for collision with the overhead section in the navigable air space. The applicable federal LORS as discussed below are intended to ensure the distance and visibility necessary to prevent such collisions.

FEDERAL

- Title 14, Part 77 of the Federal Code of Regulations (CFR), “Objects Affecting the Navigation Space.” Provisions of these regulations specify the criteria used by the Federal Aviation Administration (FAA) for determining whether a “Notice of Proposed Construction or Alteration” is required for potential obstruction hazards. The need for such a notice depends on factors related to the height of the structure, the slope of an imaginary surface from the end of nearby runways to the top of the structure, and the length of the runway involved. Such notification allows the FAA to ensure that the structure is located to avoid the aviation hazards of concern.
- FAA Advisory Circular (AC) No. 70/460-2H, “Proposed Construction and or Alteration of Objects that may Affect the Navigation Space.” This circular informs each proponent of a project that could pose an aviation hazard of the need to file the “Notice of Proposed Construction or Alteration” (Form 7640) with the FAA.
- FAA AC No. 70/460-1G, “Obstruction Marking and Lighting.” This circular describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.

INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION

Transmission line-related radio-frequency interference is one of the indirect effects of line operation as produced by the physical interactions of line electric fields. Since electric fields are unable to penetrate most materials including the soil, such interference and other electric field effects are not associated with underground lines. The level of any such interference usually depends on the magnitude of the electric fields involved. Because of this, the potential for such impacts could be assessed from field strength estimates obtained for the line. The following

regulations are intended to ensure that such lines are located away from areas of potential interference and that any interference is mitigated whenever it occurs.

FEDERAL

- Federal Communications Commission (FCC) regulations in Title 47 CFR, Section 15.25. Provisions of these regulations prohibit operation of any devices producing force fields, which interfere with radio communications, even if (as with transmission lines) such devices are not intentionally designed to produce radio-frequency energy. Such interference is due to the radio noise produced by the action of the electric fields on the surface of the energized conductor. The process involved is known as corona discharge but is referred to as spark gap electric discharge when it occurs within gaps between the conductor and insulators or metal fittings. When generated, such noise manifests itself as perceivable interference with radio or television signal reception or interference with other forms of radio communication. Since the level of interference depends on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration and weather conditions, maximum interference levels are not specified as design criteria for modern transmission lines. The FCC requires each line operator to mitigate all complaints about interference on a case-specific basis. Staff usually recommends specific conditions of certification to ensure compliance with this FCC requirement.

STATE

- General Order 52 (GO-52), California Public Utilities Commission (CPUC). Provisions of this order govern the construction and operation of power and communications lines and specifically deal with measures to prevent or mitigate inductive interference. Such interference is produced by the electric field induced by the line in the antenna of a radio signal receiver.

Several design and maintenance options are available for minimizing these electric field-related impacts. When incorporated in the line design and operation, such measures also serve to reduce the line-related audible noise discussed below.

AUDIBLE NOISE

INDUSTRY STANDARDS

There are no design-specific federal regulations to limit the audible noise from transmission lines. As with radio noise, such noise is limited instead through design, construction or maintenance practices established from industry research and experience as effective without significant impacts on line safety, efficiency maintainability and reliability. All overhead high-voltage lines are designed to assure compliance. As with radio-frequency noise, such audible noise usually results from the action of the electric field at the surface of the line conductor and could be perceived as a characteristic crackling, frying or hissing sound or hum, especially in wet weather. Since (as with communications interference), the noise level depends on the strength of the line electric field, the potential for perception

can be assessed from estimates of the field strengths expected during operation. Such noise is usually generated during rainfall, but mainly from overhead lines of 345 kV or higher. It is, therefore, not generally expected at significant levels from those of less than 345 kV such as the ones proposed for Unit 7. Research by the Electric Power Research Institute (EPRI 1982) has validated this by showing the fair-weather audible noise from modern transmission lines to be generally indistinguishable from background noise at the edge of a 100-ft right-of-way.

NUISANCE SHOCKS

INDUSTRY STANDARDS

There are no design-specific federal regulations to limit nuisance shocks in the transmission line environment. For modern overhead high-voltage lines, such shocks are effectively minimized through grounding procedures specified in the National Electrical Safety Code (NESC) and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE). Nuisance shocks are caused by current flow at levels generally incapable of causing significant physiological harm. They result mostly from direct contact with metal objects electrically charged by fields from the energized line. Such electric charges are induced in different ways by the line electric and magnetic fields. As with the overhead lines for the proposed Unit 7 project, the applicant will be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way. Staff usually recommends specific conditions of certification as necessary to ensure that such grounding is made by both the applicant and any property owners along the route.

FIRE HAZARDS

The fire hazards addressed through the following regulations are those that could be caused by sparks from conductors of overhead lines or that could result from direct contact between the line and nearby trees and other combustible objects.

STATE

- General Order 95 (GO-95), CPUC, “Rules for Overhead Electric Line Construction” specifies tree-trimming criteria to minimize the potential for power line-related fires.
- Title 14 Section 1250 of the California Code of Regulations, “Fire Prevention Standards for Electric Utilities” specifies utility-related measures for fire prevention.

HAZARDOUS SHOCKS

The hazardous shocks addressed by the following regulations and standards are those that could result from direct or indirect contact between an individual and the energized line whether overhead or underground. Such shocks are capable of serious physiological harm or death and remain a driving force in the design and operation of transmission and other high-voltage lines.

STATE

- GO-95, CPUC. “Rules for Overhead Line Construction”. These rules specify uniform statewide requirements for overhead line construction regarding ground clearance, grounding, maintenance and inspection. Implementing these requirements ensures the safety of the general public and line workers.
- GO-128, CPUC. “Rules for Construction of Underground Electric Supply and Communications Systems”. These rules specify the requirements and minimum standards for the safe construction and operation of underground lines AC power and communication circuits.
- Title 8, CCR, Section 2700 et seq., Sections 2700 through 2974. “High Voltage Electric Safety Orders”. These safety orders establish essential requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment

LOCAL

Public Works Code, City and County and City of San Francisco. Elements of this code specify the requirements and the practices for safely undergrounding utility power lines.

INDUSTRIAL STANDARDS

There are no design-specific federal regulations to prevent hazardous shocks from overhead power lines. Safety is assured within the industry from compliance with the requirements in the National Electrical Safety Code, Part 2: Safety Rules for Overhead Lines. These provisions specify the minimum national safe operating clearances applicable in areas where the line might be accessible to the public. They are intended to minimize the potential for direct or indirect contact with the energized line. Specific safety-related placement and burial requirements are similarly specified with respect to underground lines.

ELECTRIC AND MAGNETIC FIELD (EMF) EXPOSURE

The possibility of deleterious health effects from electric and magnetic field exposure has increased public concern in recent years about living near high-voltage lines. Both fields occur together whenever electricity flows, hence the general practice of describing exposure to them together as EMF exposure. The available evidence as evaluated by CPUC, other regulatory agencies, and staff, has not established that such fields pose a significant health hazard to exposed humans. However, staff considers it important, as does the CPUC, to note that while such a hazard has not been established from the available evidence, the same evidence does not serve as proof of a definite lack of a hazard. Staff, therefore considers it appropriate in light of present uncertainty, to reduce such fields as feasible without affecting safety, efficiency, reliability and maintainability. For the proposed Unit 7 project, both electric and magnetic fields would be encountered around the overhead portions. However, only magnetic fields would be encountered around the underground portion since it alone can penetrate the soil from the line’s underground location.

While there is considerable uncertainty about the EMF/health effects issue, the following facts have been established from the available information and have been used to establish existing policies:

- Any exposure-related health risk to the exposed individual will likely be small.
- The most biologically significant types of exposures have not been established.
- Most health concerns are about the magnetic field.
- The measures employed for such field reduction can affect line safety, reliability, efficiency and maintainability, depending on the type and extent of such measures.

STATE

In California, the CPUC (which regulates the installation and operation of high-voltage lines in California) has determined that only no-cost or low-cost measures are presently justified in any effort to reduce power line fields beyond levels existing before the present health concern arose. The CPUC has further determined that such reduction should be made only in connection with new or modified lines. It required each utility within its jurisdiction to establish EMF-reducing design guidelines for all new or upgraded power lines and related facilities within their respective service areas. The CPUC further established specific limits on the resources to be used in each case for field reduction. Such limitations were intended by the CPUC to apply to the cost of any redesign to reduce field strength or relocation to reduce exposure. Utilities not within the jurisdiction of the CPUC voluntarily comply with these CPUC requirements. This CPUC policy resulted from assessments made to implement CPUC Decision 93-11-013 of 1989.

In keeping with this CPUC policy, staff requires evidence that each proposed overhead line will be designed according to the EMF-reducing design guidelines applicable to the utility service area involved. These field-reducing measures can impact line operation if applied without appropriate regard for environmental and other local issues bearing on safety, reliability efficiency and maintainability. It is therefore, up to each applicant to ensure that such measures are applied in ways, and to an extent without significant impacts on line operation and safety. The extent of such applications will be reflected by the ground-level field strengths as measured during operation. When estimated or measured for the line, such field strengths can be used by staff and other regulatory agencies for comparison with fields of lines of similar voltage and current-carrying capacity. Such field strengths can be estimated for any given design using established procedures. Estimates are specified for a height of one meter above the ground, in units of kilovolts per meter (kV/m), for the electric field, and milligauss (mG) for the companion magnetic field. Their magnitude depends on line voltage (in the case of electric fields), the geometry of the structures, degree of cancellation from nearby conductors, distance between conductors and, in the case of magnetic fields, amount of current in the line.

Since each new line in California is currently required to be designed according to the EMF-reducing guidelines of the utility in the service area involved, its fields are required under existing CPUC policies to be similar to fields from similar lines in that

service area. A condition of certification is usually proposed by staff to ensure implementation of the design measures necessary. The applicable condition for this project is **TLSN-1**.

One of the most effective ways to reduce line fields is to closely place the lines together to allow for maximum cancellation from the interaction of all the fields involved. Such field strength cancellation occurs maximally with underground lines as they are placed within their burial casings. As a result, underground lines produce fields of much lower strengths than from their overhead counterparts of the same voltage and current-carrying capacity. Design and placement guidelines are established by the CPUC-regulated utilities in keeping with CPUC requirements for safety, efficiency and reliability. The other utilities voluntarily comply with such requirements when undergrounding is necessary. The applicant (SECAL 2000a, pages 2-29 through 2-32) has provided the details of the applicable designs, routing approach, and burial methods as necessary to ensure the safety, efficiency, and reliability of the proposed underground portion. The strength of the surface-level magnetic fields from such underground lines diminishes more rapidly away from the line than with their overhead counterparts of the same current-carrying capacity. Because of such rapid strength diminution, such lines are unlikely to contribute significantly to residential magnetic field levels as currently located along city streets and roadways. For all such lines, staff assesses field strength acceptability mostly in terms of compliance with the applicable utility guidelines relative to safety, conductor configuration, and burial practices along the right-of-way.

INDUSTRIAL STANDARDS

There are no health-based federal regulations or industry codes specifying environmental limits on the strengths of fields from power lines. However, the federal government continues to conduct and encourage research necessary for an appropriate policy on the EMF/health issue.

In the face of the present uncertainty, several states have opted for design-driven regulations ensuring that fields from new lines are generally similar to those from existing lines. Some states (Florida, Minnesota, New Jersey, New York, Montana) have set specific environmental limits on one or both fields in this regard. These limits are, however, not based on any specific health effects. Most regulatory agencies believe, as does staff, that health-based limits are inappropriate at this time. They also believe that the present knowledge of the issue does not justify any retrofit of existing lines.

Before the present health-based concern developed, measures to reduce field effects from power line operations were mostly aimed at the electric field component whose effects can manifest themselves as the previously noted radio noise, audible noise and nuisance shocks. The present focus is on the magnetic field because of the noted fact that only it can penetrate the soil, building and other materials to potentially produce the types of health impacts at the root of the present concern. As one focuses on the strong magnetic fields from the more visible overhead transmission and other high-voltage power lines, staff considers it important for perspective, to note that an individual in a home could be exposed for short periods

to much stronger fields while using some common household appliances (National Institute of Environmental Health Services and the U.S Department of Energy, 1995). Scientists have not established which of these types of exposures would be more biologically meaningful in the individual. Staff notes such exposure differences only to show that high-level magnetic field exposures regularly occur in areas other than around high-voltage power lines.

SETTING

The proposed Unit 7 project will be located on approximately 6.5 acres in the south-central portion of the existing 20-acre site of the Potrero PP, which is owned by Mirant. There are existing overhead lines connecting Units 3 through 6 to the PG&E system. These lines will be removed and their support towers modified to support the new Unit 7-related lines, which will transmit the power from all the Potrero Power Plant units. The nearest residences to this overhead portion would be approximately 250 feet to the west of the proposed new on-site switchyard. Since the project site is closed to the general public, any potentially significant EMF exposure in the overhead section would be on site with respect to workers, regulatory inspectors, or approved Mirant guests. Given the 250-ft distance to the nearest residences, the long-term EMF exposure of the present concern would be insignificant when Unit 7 and the others are operating.

As discussed by the applicant (SECAL 2000a, pages 2-30 and 8.10-2), the route of the underground section will begin at the exit from the Potrero Switchyard at the corner of Illinois Avenue and 23rd Street. It will then continue to the end of Illinois Avenue from where it will run along an abandoned rail right-of-way directly into Islais Creek. The route will then cross underneath Islais Creek through a bored hole 20 feet to 30 feet below the creek bed. Once across Islais Creek, the route will continue down Cargo Way to Jennings Street, then southwest to Evans Avenue to its entry point at the existing PG&E Hunters Point Substation. The practice of routing underground lines along city streets, roadways or railroad rights-of-way is common among all California utilities as a way of minimizing their location near places of human habitation. Any human exposure of potential significance with respect to these Unit 7 underground lines would be the short-term exposure to passersby along the route. Such exposure patterns are common with all underground power lines.

PROJECT DESCRIPTION

According to information from the applicant (SECAL 2000a, page 5-1), the overhead portion of the proposed Unit 7's lines will be made up of the components listed below.

- The single-circuit 115 kV circuit connecting the proposed new Mirant switchyard to the connection points within PG&E's Potrero Substation directly adjacent to it.
- The proposed new, 115 kV Mirant switchyard located on western side of Unit 7.

This overhead circuit will be supported on a 54-ft lattice tower allowing for a minimum vertical clearance of 10 feet as the circuit spans the space between the proposed new Mirant switchyard and the Potrero Substation. Staff considers the

applicant's proposed design, construction and operation according to PG&E standards and practices (SECAL 2000a, page 2-23) as reflecting compliance with the LORS of concern in this analysis. The underground lines as described by the applicant (SECAL 2000a, pages 2-29 through 2-33) will consist of solid dielectric cables closely spaced together within two parallel underground conduits. Their point of ground entry will be within the existing Potrero Substation.

As noted by the applicant, the requirement for undergrounding significantly limits the choice of routes necessary (as with similar PG&E lines) to maximize the distance from area residences. Details of the routing, placement and burial procedures have been provided by the applicant (SECAL 2000a, pages 2-30) to reflect similarity with other underground lines within San Francisco and the other parts of the PG&E service area.

IMPACTS

GENERAL IMPACTS

GO-95, GO-128, and Title 8, CCR Section 2700 et seq., as noted in the LORS section, provide the minimum regulatory requirements necessary to prevent the direct or indirect contact previously discussed in connection with hazardous shocks or aviation hazards in the overhead section. Of secondary concern are the field-related impacts manifesting as nuisance shocks, radio noise, communications interference and magnetic field exposure. The relative magnitude of such impacts would be reflected in the field strengths characteristic of a given line design. Since the field-reducing measures can affect line operations, the extent of their implementation and the related magnitude of their field strengths will vary according to environmental and other local conditions bearing on line safety, efficiency, reliability and maintainability. They will therefore, vary from one service area to the other according to prevailing conditions. It would be up to each project proponent to apply such measures to the extent appropriate for the geographic area involved. The potential for all these impacts is assessed separately as related separately to the overhead and underground sections.

PROJECT SPECIFIC IMPACTS

AVIATION SAFETY

Since the overhead lines for the proposed Unit 7 project will be located entirely on-site on existing structures not posing a significant collision hazard to area aircraft, staff does not expect these lines to pose any aviation hazard when all units are being operated. An FAA "Notice of Construction or Alteration" will not be required, according to existing regulatory criteria. Therefore, staff does not consider additional aviation-related safety measures as necessary for these lines.

INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION

The previously noted corona-related communications interference is most commonly caused by irregularities (such as nicks and scrapes on the conductor

surface), sharp edges on suspension hardware, and other discontinuities around the conductor surface. The proposed overhead portion will be constructed according PG&E construction practices minimizing the potential for such surface irregularities. Moreover, the potential for such interference is usually of concern only for lines of 345 kV and above, and not these 115 kV lines. However, if such corona noise were to be generated, staff would expect any interference-related impacts to be minimal at the nearest residences 250 feet away. The applicant arrived at the same conclusion from their calculation of such impact potential (SECAL 2000a, page 2-53). Any specific complaints will have to be resolved by the applicant as required by FCC. Staff has recommended a specific condition of certification (**TLSN-3**) in this regard.

AUDIBLE NOISE

As with radio noise, the low-corona design for the overhead portion of the proposed lines will, (as with all PG&E lines) minimize the potential for corona-related audible noise. This means, as reflected by the applicant's calculations (SECAL 2000a, page 2-53) that the line will not add significantly to current background noise levels in the project area. For an assessment of the noise from all phases of the proposed Unit 7 project and related facilities, please refer to staff's analysis in the **Noise** section.

FIRE HAZARDS

As is current PG&E policy and industry practice, the fire prevention and suppression measures for the existing Potrero PP lines will continue to be implemented with respect to the proposed overhead lines. The applicant's intended compliance with the clearance-related aspects of GO-95 constitutes is an important aspect of effective compliance in this regard.

HAZARDOUS SHOCKS

The applicant's noted intention to implement the GO-95- and GO-128-related measures against direct contact with the energized line (SECAL 2000a, page 2-23) will serve to minimize the risk of hazardous shocks. Staff recommends condition of certification **TLSN-1** to ensure implementation of the necessary mitigation measures.

NUISANCE SHOCKS

As is current PG&E practice, the potential for nuisance shocks around the overhead and underground sections will be minimized boundaries through standard grounding practices. Staff recommends condition for certification, **TLSN-2** to ensure such grounding.

ELECTRIC AND MAGNETIC FIELD EXPOSURE

For the overhead portion of the proposed lines, the applicant (SECAL 2000a, page 2-53 and Appendix P) calculated a maximum field strength of 1.46 kV/m for the area around the line. This would diminish to 0.71 kV/m at the Potrero PP property boundary and 0.005 kV/m at the nearest residence 250 feet away. The maximum value for magnetic fields along the route was calculated as 843 mG, diminishing to

160 mG at the plant boundary, and a near-background level of 1.14 mG at the nearest residence. These field strengths are as staff expects for PG&E lines of similar design, voltage and current-carrying capacity. Staff has verified the accuracy of the applicant's calculations with regard to parameters bearing on field strength dissipation and exposure assessment, and recommends a specific condition of certification (**TLSN-4**) as a validation measure.

The City and County of San Francisco requires undergrounding for new lines but also for existing lines in specified areas to avoid visual impacts as previously noted. Since the applicant has chosen the most reliable field strength-reducing configuration for the project's underground lines in keeping with San Francisco's safety requirements (reflecting current PG&E practices), staff does not consider it necessary to recommend validation measurements along the route proposed for this underground Unit 7 line.

CUMULATIVE IMPACTS

The reported field strengths were calculated by the applicant for the overhead section of the proposed Unit 7 lines to factor the interactive effects of the fields from all the overhead Potrero Power Plant lines involved. Therefore, these values should be seen as representing any cumulative exposures associated with the presence of all the lines around Potrero Power Plant. As reflected in the calculated values, any such exposures would be similar to those associated with PG&E lines of similar voltage and current-carrying capacity.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Since electric or magnetic field health effects have neither been established nor ruled out for overhead and underground lines, the public health significance of any Potrero Power Plant-related field exposures cannot be characterized with certainty. The long-term, mostly residential magnetic exposure at the root of the present health concern will be insignificant for the overhead section as reflected by the near-background levels calculated at the nearest residences. Such low levels should serve to limit any concerns about possible health impacts. On-site worker or public exposures would be short-term and at levels expected for similar PG&E designs and current-carrying capacity. Such exposures are well understood and have not been established as posing a health hazard to humans. The underground portion will be designed and routed according to current PG&E's guidelines and will therefore, yield the lowest possible residential exposures in keeping with current CPUC policies.

The potential for nuisance shocks will be minimized through grounding and other field-reducing measures to be implemented by the applicant in keeping with current PG&E guidelines reflecting common industry practices. Since the overhead section will be supported on existing structures not posing a significant risk to area aviation, staff does not expect this section to pose a significant aviation hazard during Unit 7 operations. The use of low-corona line design together with appropriate

construction practices will minimize the potential for corona noise and its related interference with radio-frequency communication in the project area.

RECOMMENDATIONS

Since the 115 kV overhead portion of the proposed Unit 7 lines will be designed according to the applicable safety and field-reducing guidelines and routed entirely within the site of the proposed Unit 7 project, staff recommends approval with specific respect to the line-related impacts of concern in this analysis. If such approval is granted, staff recommends that the Energy Commission adopt the conditions of certification specified below to ensure implementation of the measures necessary to achieve the field reduction and line safety assumed by the applicant.

The underground portion is proposed as necessary for maximum field strength reduction, efficiency and distancing from buildings along the route according to applicable PG&E practices. Therefore, staff recommends approval without design or route changes.

CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall construct the overhead portion of the proposed Unit 7 transmission line according to the requirements of CPUC's GO-95, GO-52, Title 8, Section 2700 et seq. of the California Code of Regulations and PG&E's EMF reduction guidelines arising from CPUC Decision 93-11-013 of 1989. The underground section from Unit 7 to the Hunters Point Substation shall be constructed according to the requirements of GO-128.

Verification: Thirty days before starting construction of Unit 7's transmission line or related structures and facilities, the project owner shall submit to the Commission's Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming that the overhead section will be constructed according to the requirements GO-95, GO 52, Title 8, Section 2700 et seq. of the California Code of Regulations, and PG&E's EMF-reduction guidelines arising from CPUC Decision 93-11-013. The letter shall also affirm that the underground section will be constructed according to the requirements of GO-128.

TLSN-2 The project owner shall ensure that all metallic objects along the route of the overhead section are grounded according to industry standards.

Verification: At least 30 days before the lines are energized, the project owner shall transmit to the CPM a letter confirming compliance with this condition.

TLSN-3 The project owner shall take reasonable steps to resolve all complaints of interference with radio or television signals from operation of the overhead section of the proposed lines.

Verification: All reports of line-related complaints shall be summarized along with related mitigation measures for the first five years, and provided in an annual report to the CPM.

TLSN-4 The project owner shall engage a qualified consultant to measure the strengths of the line electric and magnetic fields from the overhead section of the proposed lines line before and after they are energized. Measurements shall be made at points on-site and at the nearest residence for which field strength estimates were provided.

Verification: The project owner shall file copies of the pre-and post-energization measurements with the CPM within 60 days after completion of the measurements.

REFERENCES

SECAL (Southern Energy California) 2000a. Application for Certification, Volumes I and II, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission on May 31 2000.

Electric Power Research Institute (EPRI) 1982. Transmission Line Reference Book: 345 kV and Above.

Energy Commission Staff 1992. High Voltage Transmission Lines: Summary of Health Effects Studies. California Energy Commission Publication, P700-92-002.

National Institute of Environmental Health Services 1998. An Assessment of the Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields. A Working Group Report, August, 1998.

VISUAL RESOURCES

Michael Clayton

SUMMARY

Energy Commission staff analyzed both the potential visual impacts of the proposed Potrero Power Plant Unit 7 Project (Unit 7) and the compliance of the project with applicable laws, ordinances, regulations, and standards. Staff concludes that the proposed project would cause adverse but not significant visual impacts. However, effective implementation of the Applicant and staff proposed mitigation measures, and staff's recommended conditions of certification, would reduce the adverse visual impacts that would be caused by the project. Staff also concludes that the proposed mitigation, as augmented by staff's recommended conditions of certification, would bring the project into compliance with applicable laws, ordinances, regulations, and standards regarding visual resources.

Also, staff reviewed the demographic information provided in the Socioeconomics section of this PSA in relation to the location(s) around the proposed power plant that have the potential to receive a significant visual resources impact. Based on information collected during the course of this analysis from community members and from governmental sources, staff has determined that, with the implementation of mitigation proposed by the Applicant and mitigation and conditions of certification proposed by staff, there will not be an unmitigated disproportionate impact on a minority or low-income population.

INTRODUCTION

Visual resources are the natural and cultural features of the environment that can be viewed. This analysis focuses on whether Unit 7 would cause significant adverse visual impacts and whether the project would be in compliance with applicable laws, ordinances, regulations, and standards. The determination of the potential for significant impacts to visual resources resulting from the proposed project is required by the California Environmental Quality Act (CEQA) Public Resources Code section 21000 et seq. and Title 20, California Code of Regulations, section 1701 et seq.¹. The determination of the compliance of the proposed project with applicable laws, ordinances, regulations, and standards is required by Public Resources Code section 25525.

ORGANIZATION OF ANALYSIS

This analysis is organized as follows:

- Description of analysis methodology;
- Description of applicable laws, ordinances, regulations and standards;
- Description of the project aspects that may have the potential for significant visual impacts;

¹ The California Energy Commission's power plant siting regulations.

- Assessment of the visual setting of the proposed power plant site and linear facility routes;
- Evaluation of the visual impacts of the proposed project on the existing setting;
- Evaluation of compliance of the project with applicable laws, ordinances, regulations, and standards;
- Identification of measures needed to mitigate any potential significant adverse impacts of the proposed project and to achieve compliance with applicable laws, ordinances, regulations, and standards.
- Conclusions and Recommendations; and
- Proposed Conditions for Certification

ANALYSIS METHODOLOGY

Visual resources analysis has an inherent subjective aspect. However, the use of generally accepted criteria for determining impact significance and a clearly described analytical approach aid in developing an analysis that can be readily understood.

SIGNIFICANCE CRITERIA

Commission staff considered the following criteria in determining whether a visual impact would be significant.

STATE

The CEQA Guidelines defines a “significant effect” on the environment to mean a “substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including...objects of historic or aesthetic significance (Cal. Code Regs., tit.14, § 15382).

Appendix G of the Guidelines, under Aesthetics, lists the following four questions to be addressed regarding whether the potential impacts of a project are significant:

1. Would the project have a substantial adverse effect on a scenic vista?
2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?
3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?
4. Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

LOCAL

Energy Commission staff considers any local goals, policies, or designations regarding visual resources. Conflicts with such laws, ordinances, regulations, and standards can constitute significant visual impacts. See the section on Applicable Laws, Ordinances, Regulations, and Standards.

PROFESSIONAL STANDARDS

Professionals in visual impact analysis have developed a number of questions as a means of evaluating the potential significance of visual impacts (see Smardon 1986). The questions listed below address issues commonly raised in visual analyses for energy facilities. Staff considers these questions in assessing whether a project would cause a significant impact in regard to any of the four CEQA criteria listed above.

- Will the project substantially alter the existing viewshed, including any changes in natural terrain?
- Will the project deviate substantially from the form, line, color, and texture of existing elements of the viewshed that contribute to visual quality?
- Will the project eliminate or block views of valuable visual resources?
- Will the project result in significant amounts of backscatter light into the nighttime sky?
- Will the project be in conflict with directly identified public preferences regarding visual resources?
- Will the project result in a significant reduction of sunlight, or the introduction of shadows, in areas used extensively by the community?
- Will the project result in a substantial and persistent visible exhaust plume?

VIEW AREAS AND KEY OBSERVATION POINTS

The proposed project is visible from a number of areas in the project region. Energy Commission staff evaluated the visual impact of the project from each of these areas. Staff used Key Observation Points², or KOPs, as representative locations from which to conduct detailed analyses of the proposed project and to obtain existing conditions photographs and prepare visual simulations. KOPs are selected to be representative of the most critical locations from which the project would be seen. However, KOPs are not the only locations that staff considered in each view area.

EVALUATION PROCESS

For each view area, staff considered the existing visual setting and the visual changes that the project would cause to determine impact significance. Staff conducted a site visit and concluded that five of the KOPs presented in the AFC were appropriate for this analysis. However, staff also requested that KOP 4 be revised to provide a less obstructed view of the site from the Hunter's Point neighborhood. Staff also requested that four new KOPs be added to assess the

² The use of KOPs or similar view locations is common in visual resource analysis. The US Bureau of Land Management and the US Forest Service use such an approach.

potential visual impacts on the following areas and facilities: (a) the Potrero Hill neighborhood near Watchman Way (KOP 1), (b) Pacific Bell Park (KOP 7), (c) Aqua Vista Park (KOP 8), and recreational boaters on San Francisco Bay (KOP 9). The results of staff's analysis are summarized in the Visual Analysis Summary presented in VISUAL RESOURCES Appendix A and discussed in detail in subsequent sections of this analysis. Existing conditions photographs and photosimulations from each KOP are presented with all figures in VISUAL RESOURCES Appendix B.

ELEMENTS OF THE VISUAL SETTING

To assess the existing visual setting, staff considered the following elements:

Visual Quality

Visual quality is an expression of the visual impression or appeal of a given landscape and the associated public value attributed to the visual resource. This analysis used an approach that considers visual quality as ranging from outstanding to low. Outstanding visual quality is a rating reserved for landscapes that would be what a viewer might think of as "picture postcard" landscapes. Low visual quality describes landscapes that are often dominated by visually discordant human alterations, and do not provide views that people would find inviting or interesting (Buhyoff et al., 1994).

Viewer Concern

Viewer concern is a measurement of the level of viewer interest regarding the visual resources in an area. Official statements of public values and goals reflect viewers' expectations regarding a visual setting. This analysis also employed land use as an indicator of viewer concern. Uses associated with 1) designated parks, monuments, and wilderness areas, 2) scenic highways and corridors, 3) recreational areas, and 4) residential areas are generally considered to have high viewer concern. Travelers on other highways and roads, including those in agricultural areas, may have moderate viewer concern depending on viewer expectations as conditioned by regional and local landscape features. Commercial uses, including business parks, typically have low-to-moderate viewer concern, though some commercial developments have specific requirements related to visual quality, with respect to landscaping, building height limitations, building design, and prohibition of above-ground utility lines, that indicate high viewer concern. Industrial uses typically have the lowest viewer concern because workers are focused on their work, and generally are working in surroundings with relatively low visual value.

Viewer Exposure

The visibility of a landscape feature, the viewing distance to the landscape feature, the number of viewers, and the duration of the view all affect the exposure of viewers to a given landscape feature. Visibility is highly dependent on screening and angle of view. The smaller the degree of screening and/or the closer the feature is to the center of the view area, the greater its visibility is. Increasing distance reduces visibility. Viewer exposure can range from low values for all factors, such as a partially obscured and brief background view for a few motorists,

to high values for all factors, such as an unobstructed foreground view from a large number of residences.

Visual Sensitivity

The overall level of sensitivity of a view area to impacts due to visual change is a function of visual quality, viewer concern, and viewer exposure and can range from low to high.

TYPES OF VISUAL CHANGE

To assess the visual changes that the project would cause, staff considered the following factors:

Contrast

Visual contrast describes the degree to which a project's visual characteristics or elements (consisting of form, line, color, and texture) differ from the same visual elements established in the existing landscape. The degree of contrast can range from low to high. The presence of forms, lines, colors, and textures in the landscape similar to those of a proposed project indicates a landscape more capable of accepting those project characteristics than a landscape where those elements are absent. This ability to accept alteration is often referred to as visual absorption capability and typically is inversely proportional to visual contrast.

Dominance

Another measure of visual change is project dominance. Dominance is a measure of a feature's apparent size relative to other visible landscape features and the total field of view. A feature's dominance is affected by its relative location in the field of view and the distance between the viewer and the feature. The level of dominance can range from subordinate to dominant.

View Blockage

View blockage describes the extent to which any previously visible landscape features are blocked from view by the project. Blockage of higher quality landscape features by lower quality features causes adverse visual impacts. The degree of view blockage can range from none to high.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following discussion of Federal, State, and Local laws, ordinances, regulations, and standards is based on Section 8.11.1.4.3 (LORS) of the Applicant's Amendment to the Application (MIRANT 2001g, AFC Amendment pages 8.11-14 through 21).

FEDERAL

The proposed project is located on private land. Therefore, the project is not subject to federal regulations pertaining to visual resources.

STATE

The existing power plant, located near the shore of San Francisco Bay, falls under the jurisdiction of multiple planning agencies. At the state level, there is a comprehensive plan for the conservation and development of San Francisco Bay and land within 100 feet of its shoreline (San Francisco Bay Plan). This plan, adopted as state law under the McAteer-Petris Act (1969), is maintained and implemented by the Bay Conservation and Development Commission (BCDC). Also, Caltrans has designated the Bay Bridge (and portions of I-280) as eligible for State Scenic Highway designation (MIRANT 2001g, AFC Amendment p. 8.11-14). If these facilities become state designated scenic highways, the local jurisdiction would be required to enact a scenic corridor protection program that protects and enhances scenic resources. A properly enforced program can mitigate the effects of uses that might otherwise detract from the scenic values of the corridor landscape. A corridor protection program will typically stipulate specific siting, landscaping, and screening requirements; as well as require appropriate structural characteristics and surface treatments to make the development more compatible with the existing environment.

The San Francisco Bay Plan includes policies for development along the shoreline concerning appearance, design, and visual access to the Bay. The existing power plant is partially under BCDC jurisdiction. The proposed project includes structures within 100 feet of the shoreline (the new cooling water intake and discharge structure). The policies of the San Francisco Bay Plan relevant to the protection and enhancement of scenic resources are applicable to the proposed project. A list of these policies and an assessment of the project's consistency with these policies is presented in a later section of this analysis.

LOCAL

The project site is located within the City and County of San Francisco. Therefore, the project would be subject to local laws, ordinances, regulations, and standards pertaining to protecting and maintaining visual character and quality for San Francisco. Applicable laws, ordinances, regulations, and standards are from the Port of San Francisco Waterfront Plan (1999a), San Francisco Master Plan (1988), the Central Waterfront Area Plan (1990), and the San Francisco Planning Code (1999b).

The Port of San Francisco, a department of the City and County of San Francisco, is responsible for managing the shoreline of San Francisco Bay from Hyde Street Pier in the north to India Basin in the south. The Port's Waterfront Plan is the policy document governing this shoreline area (CCSF, 1999a). The goal of the Waterfront Plan that relates to visual quality states, "The design of new developments should be of exemplary quality and should highlight visual and physical access to and from the Bay, while respecting the waterfront's rich historic context and the character of neighboring development." The Waterfront Plan includes a Design and Access Element that contains policies relevant to visual quality and the proposed project.

The San Francisco Master Plan (Master Plan) contains goals, objectives, and policies for the protection and enhancement of visual resources. Three elements of

the Master Plan include relevant objectives and policies: the Commerce and Industry Element, the Recreation and Open Space Element, and the Urban Design Element. Additionally, the project site is covered under a specific plan, the Central Waterfront Area Plan (CCSF, 1990). Within the Commerce and Industry Element, the Master Plan outlines a goal for maintaining San Francisco's unique and attractive environment. The Urban Design Element specifies the majority of the objectives and policies for recognizing, enhancing, and conserving the special physical characteristics of the city.

The Central Waterfront Area Plan specifies an objective for urban design that is relevant to visual resources. The objective is to achieve an aesthetic urban form consistent with the economic development of the sub-areas. Several policies support that objective.

The San Francisco Planning Code (CCSF 199b) sets height and bulk limits for structures throughout the city (Sections 260 and 270). The proposed project would be exempt from height limits according to Section 260 (b)(2)(M), which states, "The following shall be exempt...structures and equipment necessary for the operation of industrial plants, transportation facilities, public utilities, and government installations, where otherwise permitted in this Code and where such structures and equipment do not contain separate floors..." The proposed project would also be exempt from bulk limits (Sections 260(a)(3), 270(a), and 270(b)).

There is also the 49-mile Scenic Drive that travels throughout San Francisco and passes through the project vicinity (along Indiana Street and I-280). This Scenic Drive, for the most part, is not a state designated or eligible scenic highway. However, it is a well-known, signed, and frequently traveled tourist route. The CCSF Planning Department does not have specific regulations applicable to the 49-Mile Scenic Drive (Purvis 2000), rather; certain roadway segments are regulated through the Planning Code. Restrictions for these designated roadway segments are limited to signage. The segments of the 49-Mile Scenic Drive near the project site, along Indiana Street and I-280, are not specified in the Planning code.

A list of the specific local policies applicable to the proposed project and an assessment of the project's consistency with those policies is presented in a later section of this analysis.

PROJECT DESCRIPTION

The following section describes the aspects of the project that may have the potential for significant visual impacts. These facilities include the power plant, two 180-foot high HRSG exhaust stacks, and related facilities; the plant switchyard; and the cooling water intake structure. The route locations of the two 115 kV transmission cables that would interconnect the proposed switchyard with the existing Hunter's Point Substation are also described below even though they would be installed underground within existing right of ways and city streets, and are not expected to cause significant visual impacts.

The proposed project would also include the removal of the existing Station A complex (105 feet high, 420 feet long, 106 feet wide) consisting of the turbine hall, gate house, meter house, compressor building, and pump house (**VISUAL RESOURCES Figure 1** [SECAL 2001a, Figure 2-10C], also see SECAL 2000b, Figure 2-2A). A prefabricated metal shop building located west of the meter house and compressor building would also be removed.

LOCATION

The power plant would be located at the existing Mirant California Potrero Power Plant site. The site is bounded by Illinois Street on the west, 22nd Street on the North, 23rd Street on the south, and San Francisco Bay on the east. (see **PROJECT DESCRIPTION Figure 2**. The new facilities would be situated immediately west of the existing Unit 3 power plant and stack and east of the existing switchyard (see **VISUAL RESOURCES Figure 2** [SECAL 2000a, AFC Figure 8.11-3], and **PROJECT DESCRIPTION Figure 5**, and **PROJECT DESCRIPTION Figure 6**).

POWER PLANT AND ASSOCIATED FACILITIES

The most visible features of the proposed project include two 60-foot tall air inlets to the combustion turbine generators (CTGs), the 60-foot tall steam turbine generator, the 94-foot tall heat recovery steam generator (HRSG) trains, and two 180-foot tall HRSG stacks (see **PROJECT DESCRIPTION Figure 7** [MIRANT 2001g, AFC Amendment Figure 2-3]). The Applicant has stated that a “Surface treatment of the HRSG buildings would be provided so as to reduce their visual contrast and utilitarian appearance, and improve their compatibility with the historic and developing character of the industrial waterfront neighborhood. The HRSG stacks would be treated with a low reflectance surface and colored to darken them to a medium value, similar to the colors of the existing stack (MIRANT 2001g, AFC Amendment p. 8.11-26).” Other features associated with the project include parking areas, fencing, and lighting (which is addressed in a separate section later in this analysis).

SWITCHYARD

The new switchyard would be located immediately west of the steam turbine generator facilities and east of the existing switchyard. Components of the new switchyard would appear similar to those of the existing switchyard with some structures extending to a height of 42 feet.

COOLING WATER INTAKE STRUCTURE

The cooling water intake structure would be a low rectangular building along the water line of the Bay as illustrated in **PROJECT DESCRIPTION Figure 8** **PROJECT DESCRIPTION Figure 9**, and **VISUAL RESOURCES Figure 3** (SECAL 2000a, AFC Figure 7-2). The structure would be 33 feet high and approximately one third of the structure would be visible at low tide.

ELECTRICAL TRANSMISSION INTERCONNECTION

PROJECT DESCRIPTION Figure 2 shows the proposed route of the two underground 115 kV electric transmission cables that would interconnect the Unit 7 switchyard with the Hunters Point Substation. For the most part, the route would follow existing streets and right of ways. The underground route exits the Potrero switchyard at the corner of Illinois Avenue and 23rd Street. It continues south down Illinois Avenue to its end, then follows the abandoned rail right-of-way directly to Islais Creek. The route then crosses under Islais Creek via directional boring. Once across Islais Creek, the route continues down Cargo Way to Jennings Street; turns southwest on Jennings Street to Evans Avenue; and then passes down Evans Avenue to the entrance of the Hunters Point Substation.

SETTING

REGIONAL LANDSCAPE

The proposed project would be located along the western shore of San Francisco Bay within the highly urbanized City and County of San Francisco. The San Francisco Peninsula is bordered by the Pacific Ocean on the west and San Francisco Bay on the north and east. The urban environment along the peninsula consists of industrial, commercial, residential, and recreational uses as well as open space and considerable transportation infrastructure in the form of streets, highways, and public transit facilities. Coastal hills and level Bay landscapes are dominant features within the region. As stated in the AFC, "The Ocean and Bay are often the focus of views from the hills and shoreline areas, as well as places of human activity. Islands, such as Yerba Buena Island and the major bridges crossing the Bay also form distinctive and well-known features. The East Bay Hills define the regional backdrop on the eastern side of the Bay. The hills within San Francisco provide enclosure on the west side of the Bay, form additional focal features, and often define local neighborhoods" (SECAL 2000a, AFC p. 8.11-1).

POWER PLANT REGIONAL VIEWSHED

VISUAL RESOURCES Figures 4 and 5 show the potential areas from which the existing and proposed power plant facilities might be seen (viewshed). As is apparent from the two figures, the areas of influence for the two projects (the areas from which the existing 305-foot stack and the proposed 180-foot stacks could be seen) are essentially the same and extend out to five miles. The areas depicted on the figures are considered "potential" because these viewshed areas were generated by digital terrain modeling that does not take into consideration the screening effects of buildings, vegetation, and topography. As such, the figures are not intended to be representational viewshed maps. However, the distance boundaries do provide a reasonable indication of the maximum area of visual influence for both the existing and proposed facilities. The distance zones as defined are **foreground** (0 to 1/2 mile), **middleground** (1/2 to 3 miles), and **background** (beyond 3 miles [and shown on the maps only up to 5 miles]). Within these zones of influence are a number of potentially affected neighborhoods and districts. Three outlying areas have limited opportunities for views of the project site

(primarily the Unit 3 stack) and include central San Francisco, the western highlands, and south San Francisco.

Views of the project site from Central San Francisco, including the Financial District, Nob Hill, Telegraph Hill, and the Civic Center, are primarily limited to the occupants of upper floors of high-rise and mid-rise structures with open, unobstructed views to the south and southeast. At viewing distances of approximately 2.5 to 3.5 miles, there are minimal viewing opportunities given the substantial screening provided by other high rise structures nearby and south of Market Street.

The western highlands include the Western Addition, Pacific Heights, Haight Ashbury, Twin Peaks, Diamond Heights, and Noe Valley with potential viewing distances ranging from 2.5 to 4 miles. These areas consist mainly of dense residential development. Views of the site are limited to the upper floors of two to four story structures on elevated parcels with unobstructed east to south views. Again, such viewing opportunities are relatively few given the considerable amount of screening that would occur due to taller vegetation and intervening structures.

From southern San Francisco, including the Outer Mission and Excelsior Districts, open views of the site are relatively few at distances of approximately 2.5 to 4.5 miles and are generally limited to north to east facing views from the upper stories of the residential, commercial, and industrial properties, or larger open space areas on higher ground. Screening would be substantial due to the close proximity of surrounding buildings, utilities, and vegetation.

Most views of the site are limited to viewing areas within two miles of the site. Within this foreground to middleground viewing distance, land uses are varied and typical of an urban setting. Views are available to residents; occupants of commercial and industrial facilities; motorists on local roads, Interstate 280, and the western end of the San Francisco – Oakland Bay Bridge (slightly over two miles); users of local parks and recreation areas and facilities; and boaters on San Francisco Bay. Within this viewing distance there are a number of potentially sensitive viewing areas, which are discussed later in this analysis.

IMMEDIATE POWER PLANT VICINITY

Within the project vicinity (generally two miles or less) foreground to middleground views of the site are primarily limited to the upper elevations of the surrounding terrain or to the upper floors of multi-storied structures where views toward the site are open and unobstructed by intervening vegetation or structures. Within this area, the existing Unit 3 stack is a prominent visual feature. The visual character of the project vicinity is that of a complex and dense urban environment with a mixture of land uses and a variety of structural heights and viewing elevations. Many views of the site are backdropped by dramatic, panoramic scenes of more distant cityscapes (downtown San Francisco to the north) rolling ridgelines (to the west, south, and more distant east), and the open waterscape of San Francisco Bay (to the east).

Unit 7 would be located within the boundaries of the existing Potrero Power Plant on a site that is occupied by older industrial structures and disturbed or paved areas.

The vegetation on the site primarily consists of scattered low shrubs and weedy herbaceous species, which do not provide any screening of the site's industrial visual character. The existing power plant consists of one exhaust stack (305 feet high); a steel building immediately north of the stack (125 feet high); three large fuel oil storage tanks along the north side (140 feet in diameter x 50 feet high, 157 feet in diameter by 48 feet high, and 167 feet in diameter by 65 feet high); and an electrical switchyard and steel lattice structures. The site also contains a large brick generator hall (68 feet high) and the 105-foot tall Station A complex which is to be demolished (SECAL 2000a, AFC pp. 8.11-6 and 5). Other onsite ancillary facilities include a machine shop, electric shop, warehouse, control room, and treated water tank.

The shoreline immediately north and south of the site is developed with industrial uses, primarily associated with maritime commerce. These industrial developments include large paved areas for parking and some tall structures such as cargo-loading cranes. The industrial areas immediately north of the site include large shipping facilities with tall industrial structures in the Central Basin. Farther north (approximately 1.5 miles), the new baseball stadium, Pacific Bell Park, forms a landmark structure. Beyond that, the skyline of San Francisco's high-rise downtown core forms a major regional landmark (SECAL 2000a, AFC p. 8.11-6).

Immediately south of the site within the industrial area, there is also a small park, Warm Water Cove Park. Farther south, beyond the park, there are disturbed vacant areas, the North Container Terminal, the India Basin industrial/business park area, and Hunters Point, a prominent ridge and residential neighborhood. The existing Hunters Point Power Plant is visually prominent in this area, with its own stack and related facilities (SECAL 2000a, AFC p. 8.11-6).

The area immediately to the west of the site, along Third Street, is dominated by industrial and commercial uses and scattered residential uses. Just west of Third Street, single-family and multi-family residential uses become more prominent, particularly west of I-280, with dense residential areas at the higher elevations of Potrero Hill. Other elevated residential areas in the vicinity include the Hunters Point area, Bayview district, and Bernal Heights, all to the south and southwest of the site (SECAL 2000a, AFC p. 8.11-6).

Views from Interstate-280 to the west of the site and from Interstate-80 and the Bay Bridge (westbound) to the north of the site are relatively brief due to the high rate of vehicle speeds. Portions of I-280 and I-80 along the Bay Bridge have been identified as Eligible for State Scenic Highway designation.

ELECTRICAL TRANSMISSION INTERCONNECTION

The proposed electrical transmission interconnection is located within the power plant vicinity described above. Landscapes along the underground route consist primarily of maritime industrial and industrial park scenes in close proximity to the shoreline.

CONSTRUCTION LAYDOWN AREAS

The proposed construction laydown areas (all within the existing power plant boundaries) are located within the power plant vicinity, described above.

VIEWING AREAS AND KEY OBSERVATION POINTS

Staff evaluated the visual setting and proposed project in detail from several key viewing areas including: (1) Potrero Hill, (2) I-280/Third Street Neighborhood, (3) 25th Street/Indiana Street Neighborhood, (4) Hunters Point, (5) Bernal Heights, (6) Bayview, (7) Pacific Bell Park, (8) Aqua Vista Park, and (9) San Francisco Bay. Each of these key viewing areas are shown on **VISUAL RESOURCES Figure 6** along with the locations of the nine key observation points (KOPs) used to represent these areas. A Visual Analysis Data Summary detailing the analytical results for each KOP is provided in VISUAL RESOURCES Appendix A and their existing conditions photographs and photosimulations are presented in VISUAL RESOURCES Appendix B. A discussion of the visual setting for each KOP is presented in the following paragraphs.

KOP 1 –POTRERO HILL; WATCHMAN WAY NEIGHBORHOOD

KOP 1 represents the view to the east from the cul-de-sac on Watchman Way. This neighborhood is the most visually impacted residential neighborhood on Potrero Hill. From this location, the view toward the site is elevated, over a complex urban, industrial landscape that also encompasses an expansive, panoramic view of San Francisco Bay and the East Bay Hills beyond (see **VISUAL RESOURCES Figure 7A**).

VISUAL QUALITY

The view from KOP 1 is dominated by foreground urban, industrial structures along the San Francisco eastern waterfront. The existing power plant is a prominent foreground visual element that is backdropped by San Francisco Bay and the East Bay Hills. The existing Unit 3 stack provides a prominent vertical form (and lines) in a landscape that is dominated by horizontal structural forms and lines. The panoramic view of shoreline features backdropped by the Bay and East Bay Hills encompasses a diverse landscape with increased visual interest that partially offsets the lower quality of the shoreline industrial development. The contrasting lighter structural colors and blues of the Bay and sky also add variety and interest. Visual quality is moderate.

VIEWER CONCERN

The power plant site would be visible from the numerous residences along the east side of Potrero Hill in the vicinity of Watchman Way. Residents generally anticipate open, frontal views of a highly urbanized, industrial waterfront landscape. However, new industrial features that would further detract from the panoramic views of the Bay and East Bay Hills would be perceived as detracting from the available vista views. Therefore, viewer concern is high.

VIEWER EXPOSURE

Site visibility is high in that the view of the site from KOP 1 is open and unobstructed at a foreground viewing distance of approximately 0.5 mile. Although the number of viewers is low, the duration of view from the residences is extended. Viewer exposure is moderate.

OVERALL VISUAL SENSITIVITY

For residents on the east side of Potrero Hill, the moderate visual quality and viewer exposure, combined with a high viewer concern all contribute to an overall moderate-to-high visual sensitivity.

KOP 2 – POTRERO HILL; 20TH AND MISSISSIPPI STREETS NEIGHBORHOOD

KOP 2 represents the view from the Potrero Hill residential neighborhood in the vicinity of 20th and Mississippi Streets. This neighborhood occurs along a northeast topographic spur of Potrero Hill that is lower in elevation than the area represented by KOP 1. Views from this area encompass the I-280/Third Street residential area between Potrero Hill and Interstate 280 (I-280) to the east, the waterfront industrial areas, San Francisco Bay, and the more distant East Bay Hills.

VISUAL QUALITY

The southeasterly view from KOP 2 encompasses a foreground panoramic scene dominated by the geometric block forms of dense residential development and waterfront industrial uses, backdropped by the broad, horizontal expanse of San Francisco Bay and the East Bay Hills beyond (see **VISUAL RESOURCES Figure 8A**). Though structural coloration is varied, the bluish hues of sky and water predominate. The contrast between land and water features contribute visual variety and interest to a landscape primarily of urban residential and industrial character. Visual quality is moderate, reflecting a balance between a prominent urban landscape and a panoramic background of predominantly natural features.

VIEWER CONCERN

The power plant site is visible from the numerous residences along the lower portions of Potrero Hill in the vicinity of 20th Street and Mississippi Street. While residents generally anticipate open, frontal views of a highly urbanized, industrial waterfront landscape, any new industrial features that would further detract from, or block the panoramic views of the Bay and East Bay Hills would be perceived as detracting from the more scenic aspects of these views which are less dramatic than the higher elevation views from KOP 1. Viewer concern is moderate-to-high.

VIEWER EXPOSURE

Project site visibility is moderate-to-high due to the somewhat elevated perspective of this viewpoint and the generally unobstructed view of the foreground project site available to pedestrians, motorists, and upper-level, east-facing residences. The viewing distance is approximately 0.5 mile. The number of potential viewers is low-to-moderate and the view duration is brief (pedestrians and motorists) to extended (residents). Viewer exposure is moderate.

OVERALL VISUAL SENSITIVITY

From KOP 2, the low-to-moderate visual quality is partially countered by the moderate-to-high viewer concern, which when considered with the moderate viewer exposure, results in a moderate visual sensitivity.

KOP 3 – I-280/THIRD STREET NEIGHBORHOOD

KOP 3 represents the view to the northeast from the I-280/Third Street residential neighborhood in the vicinity of 25th and Indiana Streets. KOP 3 was established at an upper floor residential structure and evaluates the views that would be available to upper floor residences with views to the project site.

VISUAL QUALITY

The view from KOP 3 includes the industrial/commercial portion of the I-280/Third area between I-280 and Third Street to the east (see **VISUAL RESOURCES Figure 9A**). The existing Station A building and Unit 3 stack are prominent features in the foreground urban, industrial landscape. Though partially visible in the background, the Bay and East Bay Hills appear as subordinate features to the more prominent geometric and complex foreground structural elements. Visual quality is moderate, reflecting a balance between a prominent urban industrial landscape and a panoramic background of predominantly natural features.

VIEWER CONCERN

The power plant site would be visible from upper-floor residences with unobstructed views toward the project site. While residents generally anticipate open, frontal views of a highly urbanized, industrial waterfront landscape, any new industrial features that would further detract from, or block views of the Bay or East Bay Hills would be perceived as detracting from the more scenic aspects of these views. Therefore, viewer concern is moderate.

VIEWER EXPOSURE

Project site visibility is moderate-to-high for those elevated upper-floor and unobstructed views represented by KOP 3. The foreground viewing distance is approximately 0.4 mile. While the number of such upper-floor viewers is low for these foreground views, the duration of view is extended. Therefore, viewer exposure is moderate.

OVERALL VISUAL SENSITIVITY

The low visual quality, low-to-moderate viewer concern, and moderate viewer exposure all contribute to a low-to-moderate rating for overall visual sensitivity.

KOP 4 – HUNTERS POINT NEIGHBORHOOD

KOP 4 represents the view to the north from the Hunters Point residential area, which is located south of the project site at a distance of slightly less than 1.5 miles. KOP 4 is located at the top of a staircase near the intersection of Hudson Avenue and Ardath Court. This location provides an elevated perspective of San Francisco's eastern industrial waterfront area.

VISUAL QUALITY

The view from KOP 4 to the north encompasses an immediate foreground of residential development, overlooking the industrial areas along San Francisco's eastern waterfront. The waterfront industrial areas are generally east of I-280 and are backdropped by the downtown financial district, Bay Bridge, Yerba Buena Island, and San Francisco Bay. The visible landscape is comprised of a mosaic of forms and colors ranging from the geometric shapes and hard lines of industrial structures and downtown highrises of light coloration to the more naturally appearing, dark green irregular forms of the foreground vegetation and blue, horizontal to irregular expanse of San Francisco Bay (see **VISUAL RESOURCES Figure 10A**). The contrast between the developed and more natural features contribute visual variety and interest to views from this location, though the existing Potrero Power Plant and Hunters Point Power Plant are prominent middleground features in the view. Visual quality is moderate, reflecting a balance of the panoramic vista of the distant city skyline, bridge, and Bay, with the prominence of the middleground urban industrial landscape.

VIEWER CONCERN

The power plant site is visible from numerous residences along the north side of Hunters Point. While residents generally anticipate open, frontal views of a highly urbanized, industrial waterfront landscape, any new industrial features that would further detract from views of the city skyline, Bay Bridge, or Bay would be perceived as detracting from the more scenic elements of these views. Viewer concern at this middleground viewing distance is moderate.

VIEWER EXPOSURE

Project site visibility is moderate and reflects a balance between improved visual access resulting from an elevated perspective over the project area, and reduced visual access which results from a more distant middleground viewing location (approximately 1.4-mile viewing distance), partial screening by existing structures, and the solid backdrop provided by existing structures. The number of potential viewers is moderate-to-high and the potential view duration is brief (pedestrians and motorists) to extended (residents). Viewer exposure is moderate.

OVERALL VISUAL SENSITIVITY

From KOP 4, the moderate visual quality, viewer concern, and viewer exposure all contribute to an overall moderate visual sensitivity.

KOP 5 – BERNAL HEIGHTS NEIGHBORHOOD

KOP 5 represents the view to the northeast from the Bernal Heights area in the vicinity of Rutledge and Brewster Streets. Public views are somewhat limited in this area though a number of northeast facing residents have direct, but partially screened (by Potrero Hill and existing structures) views of the project site.

VISUAL QUALITY

KOP 5 provides a somewhat elevated and panoramic vista over a highly urbanized landscape of residential, industrial, and commercial development. The existing

power plant is visible in the middleground and the Unit 3 stack is a prominent vertical element that is backdropped by San Francisco Bay and the East Bay Hills beyond (see **VISUAL RESOURCES Figure 11A**). Visual quality is moderate and reflects a balancing of the scenic qualities associated with the panoramic vista of the greater Bay landscape with the predominance of the foreground to middleground complex urban character which is generally lacking in scenic or otherwise unique visual qualities.

VIEWER CONCERN

The power plant site is partially visible from northeast-facing residences and public streets. While residents generally anticipate open views of a highly urbanized, residential and industrial waterfront landscape, any new industrial features that would further detract from, or block views of the Bay or East Bay Hills would be perceived as detracting from the more scenic aspects of these views. Viewer concern is moderate at this middleground viewing distance of approximately 1.4 miles.

VIEWER EXPOSURE

Project site visibility is somewhat obscured by intervening terrain and existing structures, and is low-to-moderate for those residences with unobstructed, northeast-facing views as represented by KOP 5. While the number of such viewers is moderate for these middleground views, the duration of view is extended. The resulting viewer exposure is moderate.

OVERALL VISUAL SENSITIVITY

The moderate visual quality and viewer concern are somewhat offset by the low-to-moderate viewer exposure and the resulting visual sensitivity is low-to-moderate.

KOP 6 – BAYVIEW NEIGHBORHOOD

KOP 6 represents the view to the northeast from the residential areas in the Bayview District, located approximately 1 3/4 miles southwest of the project site. This location provides an elevated perspective of San Francisco's eastern industrial waterfront area.

VISUAL QUALITY

The view from KOP 6 to the northeast encompasses an immediate-foreground dominated by school facilities and some vegetation overlooking a middleground of industrial development along San Francisco's eastern waterfront. In the background are the East Bay Hills and a small section of San Francisco Bay. The existing Unit 3 stack is a prominent vertical feature in the landscape as is the partially screened (though closer) Hunters Point Power Plant stack (see **VISUAL RESOURCES Figure 12A**). The visible landscape is generally lacking in scenic or otherwise unique landscape features and visual quality is low-to-moderate.

VIEWER CONCERN

The power plant site is visible from numerous residences within the Bayview District. While residents generally anticipate open, frontal views of a highly

urbanized, industrial landscape, any new industrial features that would further detract from views of the city skyline, Bay Bridge, or Bay would be perceived as detracting from the more scenic elements of these views. Viewer concern at this middleground viewing distance is moderate.

VIEWER EXPOSURE

Project site visibility is moderate and results from improved visual access associated with the slightly elevated perspective and absence of significant screening at this location. This enhanced visual access is partially countered by the middleground viewing distance and solid form backdrop of the East Bay Hills (which would minimize new structure skylining). The number of potential viewers is low-to-moderate while view duration is brief (pedestrians and motorists) to extended (residents). Viewer exposure is low-to-moderate.

OVERALL VISUAL SENSITIVITY

From KOP 6, the low-to-moderate visual quality and viewer exposure combined with the moderate viewer concern cause an overall low-to-moderate visual sensitivity.

KOP 7 - PACIFIC BELL PARK

Pacific Bell Park is a recently completed baseball stadium, which is one of the region's premier sports destinations. The design of the stadium is such that the northern third of the stadium's seats are generally oriented to the south, with unobstructed views toward the proposed project location. KOP 7 represents the view from Section 328/330 of the upper level of Pacific Bell Park.

VISUAL QUALITY

The view to the south from KOP 7 is somewhat elevated and provides a panoramic vista view of San Francisco Bay and the foreground waterfront industrial areas located north of the project site and east of Third Street. The vista view is partially framed by the stadium structure and extends to the distant ridgelines of the South Bay Hills. The existing power plant is visible in the middleground and the Unit 3 stack is a prominent vertical element (see **VISUAL RESOURCES Figure 13A**). Visual quality is moderate and reflects a balancing of the greater Bay landscape's scenic qualities with the foreground to middleground complex maritime industrial character.

VIEWER CONCERN

Part of the appeal of the new stadium is the view of the City's waterfront available to various portions of the stadium. While visitors generally anticipate open views of a waterfront maritime industrial landscape, any new industrial features that would impact views of the skyline or Bay would be perceived as detracting from the more scenic elements of these views. However, it is acknowledged that the primary focus of the viewer's attention are the activities occurring on the field. Therefore, viewer concern to landscape changes in the project vicinity is low-to-moderate.

VIEWER EXPOSURE

Project site visibility from KOP 7 is low-to-moderate and reflects a balance between the elevated perspective available from the upper stands and the visual draw of the existing Unit 3 stack as a landmark middleground feature which increase project visibility, and the blending of the project features with the surrounding landscape which reduces project visibility. While the middleground viewing distance is approximately 1.6 miles, the number of potential viewers is low-to-moderate and the view duration is extended. The resulting viewer exposure is low-to-moderate.

OVERALL VISUAL SENSITIVITY

The moderate visual quality is somewhat offset by the low-to-moderate viewer concern and viewer exposure. The resulting visual sensitivity is low-to-moderate.

KOP 8 – AQUA VISTA PARK

KOP 8 represents the view to the south from Aqua Vista Park, located slightly over one-half mile due north of the project site.

VISUAL QUALITY

Though open, panoramic, vista views of San Francisco Bay and the East Bay Hills are available when viewing east from KOP 8, the view to the south toward the project site primarily encompasses the foreground shoreline landscape of Central Basin, which is dominated by maritime activities and warehouse structures, docked tanker ships, and a small marina. Much of the shoreline in the immediate area appears to have been degraded by industrial uses and the small marina is in a state of disrepair (see **VISUAL RESOURCES Figure 14A**). Visual quality is rated low-to-moderate.

VIEWER CONCERN

Users of Aqua Vista Park typically focus on the immediate landscape of Central Basin with views also being drawn to the east toward the open waters of San Francisco Bay and the East Bay Hills beyond. Although viewer concern regarding the potential impairment of views of the Bay (to the east) would be high, viewer concern regarding changes in the area south of the park, in the vicinity of the project site, is low-to-moderate.

VIEWER EXPOSURE

Project site visibility is low-to-moderate at a foreground viewing distance and reflects the partial screening of the project site by intervening warehouse structures. Although the number of viewers is low, the duration of view is extended. As a result, viewer exposure is low-to-moderate.

OVERALL VISUAL SENSITIVITY

The low visual quality and low-to-moderate viewer concern and viewer exposure contribute to an overall low-to-moderate rating for visual sensitivity.

KOP 9 – SAN FRANCISCO BAY

KOP 9 represents the view to the west from San Francisco Bay and is located slightly over one-half mile to the northeast of the project site. This viewpoint captures the shoreline views available to the recreational boaters that ply the Bay waters off the San Francisco eastern waterfront.

VISUAL QUALITY

The view to the west from KOP 9 encompasses a panoramic foreground view of San Francisco's eastern industrial waterfront area and nearshore waters of San Francisco Bay. In the background are the rolling landforms of Bernal Heights and Potrero Hill, with Sutro Tower appearing as a noticeable vertical form to the west of the project site. Most prominent in views from KOP 9 are the industrial structures comprising the existing Potrero Power Plant, with the Unit 3 stack the dominant vertical feature in the shoreline landscape (see **VISUAL RESOURCES Figure 15A**). Visual quality is low-to-moderate.

VIEWER CONCERN

From the nearshore Bay immediately to the east of Central Basin, the viewer's attention is typically drawn to the ridgelines of the peninsula to the west, the dramatic skyline of the City's downtown highrises to the north, and the Bay Bridge to the north and northeast. Boaters along this portion of the Bay generally anticipate the industrial features of the eastern waterfront and the Unit 3 stack is a particularly prominent and noticeable feature. Although viewer concern regarding any impairment of views of ridgelines and City skylines would be high, viewer concern with respect to shoreline landscape changes in the immediate project vicinity at Central Basin would be moderate as long as ridgeline views were minimally impaired.

VIEWER EXPOSURE

When viewed from KOP 9 and San Francisco Bay, the proposed project partially blends with the surrounding industrial context. The resulting visibility is moderate-to-high at this foreground viewing distance. While the number of viewers is low-to-moderate, the duration of view is extended. The resulting viewer exposure is moderate.

OVERALL VISUAL SENSITIVITY

From KOP 9, the low-to-moderate visual quality and moderate viewer concern and viewer exposure all contribute to an overall moderate rating for visual sensitivity.

OTHER VIEWING AREAS

SOUTH OF MARKET HIGHRISES

There are numerous high rise buildings in the South of Market area with east-to-south, unobstructed viewing opportunities toward the proposed project site. However, as shown in **VISUAL RESOURCES Figure 16**, the views from these highrises are panoramic in scope, encompassing the highly urbanized landscape of

the South of Market and southeastern waterfront and maritime industrial areas. Within this highly developed urban context, the project site is minimally noticeable at this middleground viewing distance, particularly given the complexity and dominance of foreground structural features.

WARM WATER COVE PARK

Warm Water Cove Park is located immediately adjacent and to the south of the existing power plant site. The proposed HRSG structures and exhaust stacks would be prominent foreground features in views to the north from this location. The stacks would appear taller than the nearby industrial buildings including the buildings closest to the park that partially block portions of the project site. The HRSG structures would replicate the industrial character already present on the site, which has low visual quality. Although viewer concern would be high for park users, the park is minimally used. Therefore, viewer exposure would be low and overall visual sensitivity would be moderate.

NATIONAL REGISTER HISTORIC DISTRICT AT PIER 70

The Port of San Francisco Waterfront Land Use Plan calls for adaptive reuse of three Union Iron Works buildings, which are historic and architecturally significant structures at Pier 70, within the potential historic district between 20th and 22nd Streets along Illinois Street. The plan proposes a mixture of maritime and non-maritime land uses in this historic district, providing access to the working waterfront so long as use is compatible with existing ship repair operations. The uses envisaged also include new residential and/or commercial activity.

The district is located approximately 1/3 mile north of the Unit 7 project site. The Union Iron Works Buildings occur two long blocks to the north along Illinois Street, although other currently vacant land within the district appears to extend almost to 22nd Street, within 1/4 mile of the project site. Existing views toward the project site from the historic district are substantially blocked or framed by intervening structures along Illinois Street. Within this industrial context and foreground screening, the project site would be minimally noticeable to occupants, pedestrians, and visitors within the district.

BAY TRAIL

The proposed Bay Trail in the project vicinity travels north along Third Street until reaching 23rd Street, then turns eastward for one block to Illinois Street, before continuing north along Illinois Street to Aqua Vista Park and Terry A. Francois Boulevard. From all viewpoints along the Bay Trail route in the vicinity of the proposed project, the view would be dominated by foreground maritime industrial and commercial structures adjacent to the route and the existing Unit 3 stack. Traveling north along Third Street between Hunters Point Boulevard and 23rd Street, the proposed project site would be partially to fully screened from views by intervening structures in the general waterfront industrial area. Traveling east along 23rd Street, users of the Bay Trail would have direct views of the site, which would include the existing power plant facilities. Traveling south on Illinois Street from Aqua Vista Park, views of the site are partially to fully screened by intervening structures along Illinois Street and within the general waterfront industrial area.

With the exception of the short segment along 23rd Street, the project site would be minimally noticeable to users of the Bay Trail given the adjacent industrial context and foreground structural screening.

IMPACTS

CONSTRUCTION IMPACTS

POWER PLANT

Construction of the proposed power plant would cause temporary visual impacts due to the presence of equipment, materials, and workforce. Construction would involve the use of cranes, heavy construction equipment, temporary storage and office facilities, and temporary laydown/staging areas. These pieces of equipment and facilities would be stored on and adjacent to the project site in an area already exhibiting industrial visual character. Visual impacts would primarily occur at the proposed power plant site and construction laydown areas over a 12 to 16-month period of time when the construction cranes and large equipment would be on-site. Approximately five cranes would be used and would range in height from under 100 feet to approximately 300 feet. With this range of heights, some visual intrusion on views of the Bay would occur, primarily for those KOPs in close proximity to the site (KOPs 1, 2, and 3). At greater viewing distances, the cranes would appear less prominent and from north and south viewing angles, the cranes would not be backdropped by the Bay or East Bay Hills. To further reduce the potential for adverse visual impacts during construction, the Applicant has indicated a willingness to lower and/or relocate high-profile construction equipment on-site when not in use (SEP 2000Dresp1, Data Response No. 78). Given the relatively short duration of power plant construction and presence of the tall cranes, adverse but not significant visual impacts would occur. However, the adverse visual impact can be lessened with implementation of staff's Mitigation Measure VIS-7 and proposed Condition of Certification VIS-4 described later in this analysis.

Also, the majority of construction activities would occur during daylight hours when supplemental lighting would not be needed. However, if supplemental construction lighting is needed, the lighting would be consistent in terms of color and intensity with lighting from other sources in the area. Furthermore, the Applicant has committed to providing directional and/or shielding devices to minimize visible lighting (SEP 2000Dresp1, Data Response No. 71). Therefore, short-term construction lighting impacts would not be significant. In order to ensure that significant construction lighting impacts do not occur, staff has recommended Condition of Certification VIS-2, presented later in this analysis.

ELECTRICAL TRANSMISSION INTERCONNECTION

Views of the electrical transmission interconnection construction equipment, materials, and activities would be available to commercial, business park, and industrial occupants, and travelers along the roads the interconnection would be following. Transmission line cable construction would be highly visible in the

foreground of views to the adjacent uses. However, occupants would have a frontal view of the cable laying equipment for a relatively short period of time. Six 1,550-foot excavations would be carried out in sequence with no more than two trench excavations active at one time. Trenching would be completed within five to six weeks and cable installation and splicing would take an additional four to five weeks. The total job time would be approximately four months (SECAL 2000a, AFC pp. 2-32 & 33). Therefore, the potential exposure for viewers would be relatively short at any location and the visual impacts associated with construction of the underground transmission cable would be adverse but not significant.

OPERATION IMPACTS

The analysis of operation impacts is presented for the view area represented by each Key Observation Point (KOP) in the Visual Analysis Summary table provided in Appendix A. For each view area and KOP, an evaluation of visual contrast, project dominance, and view blockage is provided with a concluding assessment for the severity of visual change. The potential for operations impacts to occur on additional viewing areas is also discussed.

One key visual consideration of the proposed project is the removal of the Station A building. By comparison to Station A, the new HRSG structures would be approximately 180 feet high, 47 feet long, and 105 feet wide (see Table 1). The primary visual change that would be noticed from each viewing area and Key Observation Point would be a reduction in structural mass which would be attributable to changes in structural heights and lengths. As shown in Table 1, the new HRSG structures will be substantially taller (180 feet at the top of stack) than the existing Station A building (105 feet). However, while the width of the Station A structure (106 feet) would be similar to the width of the 94-foot tall HRSG train (105 feet), above the HRSG train, the remaining 86 feet of structural height would be only the 16-foot width of the HRSG stacks. Also, while the Station A building is approximately 420 feet long (north to south), the two HRSG structures are only approximately 47 feet in length (north to south) and are spaced approximately 75 feet apart.

The resulting visual change is a substantial reduction in the structural mass on the site that was created by the 420-foot long by 105-foot high Station A building. The visual trade-off is the additional 86 feet of height attributable to the two 16-foot wide stacks. However, the reduction in structural mass will open up additional sight lines through the project site that is currently blocked by the Station A building. The impact discussions presented in the following sections address the net visual changes that would be observed from each viewing area and KOP and take into account both the reduction of structural mass (removal of Station A) and increase in structural height (addition of HRSG structures).

Table 1
Comparison of Dimensions for Station A and New HRSG Structures*

	Station A	New HRSG Structures (x2)
Height	105 feet ¹	180 feet ³ (each stack)
Width (east-west)	106 feet ²	105 feet ⁴ for the HRSG Train/Stack (lower 94 feet) 16 feet ⁴ above the HRSG Train for the Stack only (upper 86 feet)
Length (north – south)	420 feet ²	47 feet ⁴ (each HRSG Train)

1 Source: SECAL 2000a, Figure 8.11-3

2 Source: SECAL 2000b, Figure 2-2A

3 Source: SECAL 2001g, Replacement Figure 2-3

4 Source: SECAL 2000a, Figure 2-3, Dimensions are scaled approximations

KOP 1 – POTRERO HILL; WATCHMAN WAY NEIGHBORHOOD

VISUAL RESOURCES Figure 7B presents a photosimulation of the proposed project as viewed from KOP 1 at the cul-de-sac on Watchman Way. The most obvious change to the landscape would be the removal of the massive block form of the Station A complex with its dark coloration and introduction of the taller though less massive vertical forms of the HRSG structures and stacks.

VISUAL CONTRAST

The proposed project would remove the prominent horizontal block form of the Station A complex and introduce linear forms of the HRSG structures and stacks with their prominent vertical structural lines (see Table 1). While the introduced forms and lines would be consistent with the forms and lines already established by the Unit 3 facilities, the lighter coloration of the two new stacks would introduce color contrast with the darker blue colors of San Francisco Bay and the East Bay Hills. As presented in the Visual Analysis Summary table (see Appendix A), a moderate degree of visual contrast would be perceived from KOP 1 with implementation of the proposed project.

PROJECT DOMINANCE

The landscape visible from KOP 1 is comprised of a mosaic of land, water, and structural forms, all appearing co-dominant in the viewshed. The complex of foreground commercial buildings, transportation infrastructure, and maritime industrial features all compete with the picturesque backdrop of San Francisco Bay and the East Bay Hills for the viewer's attention. The proposed power plant facilities would be sufficiently prominent that they would appear co-dominant with existing urban features and the panoramic background landscape. The proposed project would appear moderate in size in the wide field of view. However, the height of the vertical HRSG stacks and the removal of Station A, a recognizable historic building which is prominent in these views, would both increase the structural prominence of the HRSG facilities. Project dominance is rated co-dominant.

VIEW BLOCKAGE

From KOP 1 the vertical HRSG structures and stacks (lower quality landscape features) would block from view slightly more of San Francisco Bay and the East Bay Hills (higher quality landscape features) than is currently blocked from view by the Station A complex. View blockage would be low-to-moderate.

OVERALL VISUAL CHANGE

From KOP 1, the overall visual change caused by the proposed project would be moderately adverse due to the moderate degree of structural contrast that would occur and the project's low-to-moderate degree of view blockage of higher quality landscape features (San Francisco Bay and the East Bay Hills).

VISUAL IMPACT SIGNIFICANCE

When considered within the context of the moderate-to-high visual sensitivity of the existing landscape and viewing characteristics, the moderately adverse visual change that would be perceived from KOP 1 would cause an adverse but not significant visual impact. This visual impact would have been significant without the removal of the Station A building. However, with removal of Station A, the project site is visually more open to the Bay and new sightlines from Potrero Hill through the site to the Bay are created. Also, the adverse visual impact can be lessened with implementation of the Applicant's proposed Mitigation Measure VIS-6, as augmented by staff's recommended Condition of Certification VIS-1 presented later in this analysis.

KOP 2 – POTRERO HILL; 20TH AND MISSISSIPPI STREETS NEIGHBORHOOD

VISUAL RESOURCES Figure 8B presents a photosimulation of the proposed project as viewed from KOP 2, near the intersection of 20th Street and Mississippi Street, northwest of the project site. Residents, pedestrians, and motorists in the vicinity would have a foreground view of the proposed project over the rooftops of the I-280/Third Street neighborhood. The complex and linear forms of the power plant structures would be clearly visible to the southeast, with the most apparent changes to the landscape being the removal of the massive block form of the Station A complex and introduction of the taller though less massive vertical forms of the HRSG facilities. The two new stacks would protrude above the Bay water line, silhouetted against the sky and East Bay Hills. The removal of the Station A complex is less apparent in views from this direction, due to distance and screening by other buildings.

VISUAL CONTRAST

The proposed project would introduce prominent linear forms with vertical structural lines into the existing waterfront industrial landscape. These forms and lines would be similar to forms and lines already established by the existing power plant and the structural contrast would be low. However, from this viewing angle relative to the positions of the project structures and the sun, the HRSG structures would frequently be viewed in silhouette, appearing darker than the lighter background of Bay, sky, and East Bay Hills (as illustrated in **VISUAL RESOURCES Figure 8B**). During these occurrences, the darker coloration of the two new stacks would

introduce color contrast with the lighter blue colors of the Bay, sky, and the East Bay Hills. As a result, a moderate degree of visual contrast would be perceived from KOP 2 with implementation of the proposed project

PROJECT DOMINANCE

Backdropped by San Francisco Bay and the East Bay Hills, the most prominent landscape feature in the view from KOP 2 is the complex urban development of the foreground I-280/Third Street neighborhood consisting of residential, commercial, and industrial structures. The proposed power plant facilities would be roughly similar in scale to the existing power plant and adjacent commercial/industrial buildings. The proposed project would appear smaller relative to the residential buildings in the immediate foreground of views from KOP 2, though prominent against the background of Bay and East Bay Hills. In the wide field of view available, the proposed structures would appear small to moderate in size and similar in extent to that of the existing power plant facilities. However, the new HRSG structures would appear more prominent than the existing Station A. Overall, the proposed project would appear co-dominant with the existing power plant and adjacent commercial and industrial buildings.

VIEW BLOCKAGE

From Key Observation Point 2 the proposed HRSG structures and stacks (lower quality landscape features) would block from view a slightly larger portion of San Francisco Bay and the East Bay Hills (higher quality landscape features) than is currently blocked from view by the Station A complex. This slight increase in view blockage would not be substantially noticeable and the removal of the Station A complex would open up new sightlines to the Bay from the areas represented by KOP 2. Also, the power plant site is not located in the center of views represented by KOP 2 as was the case for KOP 1. As a result, view blockage would be low.

OVERALL VISUAL CHANGE

From KOP 2, the overall visual change caused by the proposed project would be moderately adverse because of the moderate degree of structural visual contrast of the co-dominant project features and low degree of view blockage of higher quality landscape features.

VISUAL IMPACT SIGNIFICANCE

When considered within the context of the moderate visual sensitivity of the existing landscape, the moderately adverse visual change that would be observed from the area represented by KOP 2 would cause an adverse but not significant visual impact. This impact determination is primarily a result of the moderate degree of visual contrast that would be caused by the new HRSG structures. However, the visual impact can be lessened with implementation of the Applicant's proposed Mitigation Measure 6, as augmented by staff's recommended Condition of Certification VIS-1 presented later in this analysis.

KOP 3 – I-280/THIRD STREET NEIGHBORHOOD

VISUAL RESOURCES Figure 9B presents a photosimulation of the proposed project as viewed from KOP 3 near the intersection of 25th Street and Indiana Street. From this location, the project facilities would appear as prominent foreground features with greater height than the adjacent structures with the exception of the Unit 3 stack. Another noticeable change would be the removal of the prominent horizontal red-brick block form of the Station A complex.

VISUAL CONTRAST

The proposed project would introduce prominent linear and geometric forms with vertical and horizontal structural lines similar to those of the existing power plant facilities and structures of the I-280/Third Street Neighborhood. From this vantage point, the HRSG structures and stacks would appear slightly taller than the more massive existing Station A complex, resulting in a moderate degree of visual contrast when compared to the existing power plant structures and lower horizontal profile of the adjacent commercial and industrial buildings. The light colored stacks extending above the horizon line would contribute a low-to-moderate level of color contrast. As a result, the proposed project would cause moderate visual contrast as viewed from KOP 3.

PROJECT DOMINANCE

The landscape visible from KOP 3 is dominated by a mosaic of built commercial and industrial structures, with the background of San Francisco Bay and the East Bay Hills appearing as subordinate though noticeable features. The proposed project would appear moderate in size in the wide field of view. While the new HRSG structures with their taller stacks would be slightly more prominent than the existing Station A, the proposed facilities would appear co-dominant with the existing Unit 3 and the foreground industrial and commercial buildings.

VIEW BLOCKAGE

From Key Observation Point 3 the proposed HRSG facilities (lower quality landscape features) would block from view slightly more of the East Bay Hills and sky (higher quality landscape features) than is currently blocked from view by the Station A complex. The new stacks would also extend above the horizon line of the East Bay Hills resulting in a slight degree of “skylining.” There would be a perceptible change in views from KOP 3 and view blockage would be low-to-moderate.

OVERALL VISUAL CHANGE

From KOP 3, the overall visual change caused by the proposed project would be moderately adverse, primarily due to the moderate degree of structural contrast that would occur.

VISUAL IMPACT SIGNIFICANCE

When considered within the context of the low-to-moderate overall visual sensitivity of the existing landscape and viewing characteristics, the moderately adverse visual change that would be observed from the area represented by KOP 3 would cause

an adverse but not significant visual impact. This conclusion is primarily the result of increased contrast and view blockage that would occur relative to that presently caused by Station A. However, the visual impact can be lessened with implementation of the Applicant's proposed Mitigation Measure VIS-6, as augmented by staff's recommended Condition of Certification VIS-1 presented later in this analysis.

KOP 4 – HUNTERS POINT NEIGHBORHOOD

VISUAL RESOURCES Figure 10B presents a photosimulation of the proposed project as viewed from KOP 4, near the intersection of Hudson Avenue and Ardath Court, south of the project site. Residents, pedestrians, and motorists in the vicinity would have a middleground view of the proposed project over the maritime industrial and industrial park uses of San Francisco's southeastern waterfront.

VISUAL CONTRAST

The proposed project would introduce linear forms with vertical structural lines into the view from KOP 4. The introduced forms, lines, colors, and surface textures would be similar to the structural characteristics already present in the landscape (adjacent Unit 3 stack and commercial and industrial buildings). These characteristics would be slightly more noticeable than those of the existing Station A at this middleground viewing distance and wide field of view. The resulting visual contrast would be low when viewed from the Hunters Point area represented by KOP 4.

PROJECT DOMINANCE

The landscape visible from KOP 4 is dominated by a foreground high density urban residential neighborhood overlooking a middleground of commercial and maritime industrial uses. However, equally prominent is the picturesque background cityscape of downtown San Francisco highrises, Yerba Buena Island, and San Francisco Bay, which is spanned by the Bay Bridge. The mass and scale of the proposed power plant facilities would be consistent with adjacent middleground commercial and industrial structures and would appear relatively small in the wide field of view. As a result, overall project dominance is rated subordinate.

VIEW BLOCKAGE

From KOP 4, the proposed project would cause a slight increase in view blockage of other commercial and industrial structures to the north of the project than is currently blocked from view by Station A. However, the proposed project (lower quality landscape feature) would not impair views to any higher quality landscape features (such as San Francisco Bay, the Bay Bridge, or San Francisco downtown skyline). Therefore, view blockage would be low.

OVERALL VISUAL CHANGE

As viewed from KOP 4, the overall visual change caused by the proposed project would be only slightly adverse, reflecting the low degrees of visual contrast and view blockage associated with the project's subordinate presence in the field of view.

VISUAL IMPACT SIGNIFICANCE

When considered within the context of the moderate overall visual sensitivity of the existing landscape and viewer characteristics, the slightly adverse visual change that would be observed from the area represented by KOP 4 would cause a slightly adverse but not significant visual impact.

KOP 5 – BERNAL HEIGHTS NEIGHBORHOOD

VISUAL RESOURCES Figure 11B presents a photosimulation of the proposed project as viewed from KOP 5 in the vicinity of Rutledge and Brewster Streets in the Bernal Heights area. From this vantage point, the project's two new stacks would be slightly noticeable against a backdrop of San Francisco Bay and the East Bay Hills. Residents and pedestrians in the vicinity would have an elevated, but partially screened middleground view of the proposed project over foreground residential development and the commercial and maritime industrial uses of San Francisco's southeastern waterfront.

VISUAL CONTRAST

The proposed project would introduce linear forms with vertical structural lines into the view from KOP 5. The introduced forms, lines, colors, and surface textures would be similar to the structural characteristics already present in the landscape (adjacent Unit 3 power plant and commercial and industrial buildings) though more noticeable than those of the existing Station A due to the highlighting effect caused by the backdrop of the Bay and East Bay Hills. The resulting visual contrast would be low-to-moderate when viewed from the Bernal Heights area represented by KOP 5.

PROJECT DOMINANCE

The most prominent landscape features visible from KOP 5 are the foreground trees and residential buildings. Against a highlighting backdrop of water, and East Bay Hills, the existing Unit 3 stack is a prominent middleground feature. The new HRSG structures would appear slightly smaller in scale than the existing Unit 3 facilities but more prominent than the existing Station A. In the field of view available from this area, the proposed structures would appear small in size in comparison to the foreground trees and residential buildings. Overall, the proposed project would be perceived as a subordinate landscape element.

VIEW BLOCKAGE

From Key Observation Point 5 the proposed HRSG structures (lower quality landscape features) would block from view a slightly larger portion of San Francisco Bay and the East Bay Hills (higher quality landscape features) than is currently blocked from view by Station A. At this middleground viewing distance and wide field of view, the resulting view blockage would be low.

OVERALL VISUAL CHANGE

As viewed from KOP 5, the overall visual change resulting from the proposed project would be slightly adverse, primarily due to the introduction of additional structures into the view with resulting low-to-moderate degree of visual contrast.

VISUAL IMPACT SIGNIFICANCE

Within the context of a landscape with low-to-moderate visual sensitivity and viewing characteristics, the slightly adverse visual change that would be observed from the area represented by KOP 5 would cause an adverse but not significant visual impact.

KOP 6 – BAYVIEW NEIGHBORHOOD

VISUAL RESOURCES Figure 12B presents a photosimulation of the proposed project as viewed from KOP 6 in the Silver Avenue / Thomas Avenue neighborhood. From this vantage point, residents and pedestrians in the vicinity would have an elevated, distant middleground view of the proposed project. The most notable change in the landscape would be the removal of the Station A complex with its contrasting red-brick color and the introduction of two additional stacks of smaller scale compared to the existing Unit 3 stack.

VISUAL CONTRAST

The proposed project would replace the horizontal geometric block structure of Station A with two linear structures with vertical lines. The new structures would appear similar to the existing Unit 3 facilities and other industrial facilities visible in the wide field of view. While the light gray color of the proposed facilities would help to blend the structures with the surrounding development, the vertical forms of the HRSG stacks would be slightly more noticeable than the red-brick form of the existing Station A due to the highlight effect caused by the distant backdrop of the East Bay Hills. The resulting visual contrast would be low-to-moderate.

PROJECT DOMINANCE

The most prominent landscape elements visible from KOP 6 are the foreground school buildings and the adjacent trees. These features are backdropped by the middleground commercial and industrial areas along San Francisco's southeastern waterfront area from Central Basin to Hunters Point and India Basin. The distant horizon is defined by the ridgeline of the East Bay Hills. In the field of view available, the proposed structures would appear relatively small in size in comparison to the foreground school buildings and trees and residential buildings. However, the proposed project would appear slightly more prominent than the existing Station A and co-dominant with other prominent middleground features including the existing Unit 3 facilities and the Hunters Point power plant. Overall, the proposed project would be perceived as a subordinate-to-co-dominant landscape element.

VIEW BLOCKAGE

From Key Observation Point 6 the proposed HRSG structures (lower quality landscape features) would block from view slightly more of the East Bay Hills (higher quality landscape features) than is currently blocked from view by Station A. However, the perceptible change in the landscape as viewed from KOP 6 would be low, as would the resulting view blockage.

OVERALL VISUAL CHANGE

From KOP 6, the overall visual change resulting from the proposed project would be moderately adverse, due to the low-to-moderate degree of visual contrast and subordinate-to-co-dominant presence of the HRSG stacks.

VISUAL IMPACT SIGNIFICANCE

Within the context of a landscape that has a low-to-moderate visual sensitivity, the moderately adverse visual change that would occur when viewed from the Bayview area represented by KOP 6, would cause an adverse but not significant visual impact. This conclusion is primarily the result of the increased contrast, prominence, and view blockage caused by the proposed HRSG structures relative to that caused by the existing Station A.

KOP 7 – PACIFIC BELL PARK

VISUAL RESOURCES Figure 13B presents a photosimulation of the proposed project as viewed from KOP 7 from Section 328/330 of Pacific Bell Park. From this vantage point, spectators would have an elevated, middleground view of the proposed project. The existing Unit 3 stack is the most prominent feature extending above the horizon. The most notable change in the landscape would be the introduction of the two HRSG stacks behind the fuel storage tank to the right (west) of the existing Unit 3 stack.

VISUAL CONTRAST

The proposed project's linear forms and vertical lines would be similar to those of the existing Unit 3 facilities and nearby industrial structures. Although the new stacks would be more visible than the existing Station A, they would still be minimally noticeable in the wide field of view and would appear consistent with adjacent structures in terms of form and color. The resulting visual contrast would be low.

PROJECT DOMINANCE

The most prominent landscape elements visible from KOP 7 are the ballpark's spectator stands and light structures in the immediate-foreground and the expansive parking lot and piers immediately to the south of the park. Also prominent is the expanse of San Francisco Bay. Less prominent but still noticeable in the middleground of views from KOP 7 is the maritime industrial and commercial area to the south, which is backdropped by Hunters Point. The new facilities would be more noticeable than they otherwise might be because of the landmark created by the Unit 3 stack extending prominently above the horizon line. Although the proposed project structures are more prominent than the existing Station A, they are shorter than the existing Unit 3 stack. The new HRSG structures would appear relatively small in scale compared to the foreground features visible from KOP 7 including the ballpark stands and light structures, and the adjacent parking lot, piers, and ships. Overall, the proposed project would be a subordinate landscape feature when viewed from Pacific Bell Park.

VIEW BLOCKAGE

From Key Observation Point 7, the proposed project would cause a slight view blockage of residential and commercial structures to the south of the project site, in the Hunters Point area. This view blockage would be greater than that apparent for the existing Station A. Although the proposed stacks would extend slightly above the ridgeline of Hunters Point into an area backdropped by the more distant hills in the South Bay, the proposed project (lower quality landscape feature) would not substantially impair views to any higher quality landscape features. Therefore, view blockage would be low.

OVERALL VISUAL CHANGE

As viewed from KOP 7, the overall visual change resulting from the proposed project would be slightly adverse as a result of the low visual contrast and slightly increased view blockage that would occur.

VISUAL IMPACT SIGNIFICANCE

Within the context of a landscape that has a low-to-moderate visual sensitivity, the slightly adverse visual change that would occur when observed from Pacific Bell Park would cause an adverse but not significant visual impact.

KOP 8 – AQUA VISTA PARK

VISUAL RESOURCES Figure 14B presents a photosimulation of the proposed project as viewed from KOP 8 at Aqua Vista Park, north of the project site. From this location, park users would have a direct foreground view of the proposed project. The most notable change in the landscape would be the introduction of the upper portions of the new HRSG stacks to the right (west) of the existing Unit 3 stack. Although the lower portion of the project structures would be screened from view by intervening buildings, the upper one-third of the HRSG stacks would be visible above the low, horizontal warehouse/industrial building located along the south side of central basin as shown in the center of the photosimulation.

VISUAL CONTRAST

The proposed project would introduce linear forms with vertical structural lines. The introduced forms and lines would be similar to forms and lines already present in the landscape (adjacent industrial facilities, stacks, cranes, pilings, and masts) though the height of the stacks and their light coloration would contrast with the background of blue sky. The existing Station A is not visible from this KOP. The resulting visual contrast would be low.

PROJECT DOMINANCE

The landscape visible from KOP 8 is dominated by the maritime and shoreline features of Central Basin consisting of container ships, small pleasure craft, onshore support facilities, a marina, and warehouses. The existing Unit 3 stack to the immediate south also competes for the viewer's attention. The proposed HRSG stacks would extend slightly above the intervening warehouses. Although the stacks would appear relatively small in this confined field of view, the prominence

caused by the stacks' skylining would slightly increase project dominance to a level that would be subordinate-to-co-dominant with the adjacent structures and facilities.

VIEW BLOCKAGE

From Key Observation Point 8, the proposed HRSG stacks (lower quality landscape features) would extend slightly above the existing horizon line created by the roof line of the existing warehouses. The stacks would block from view a small portion of the sky (a higher quality landscape feature). This slight change in the view from KOP 8 would cause a low degree of view blockage.

OVERALL VISUAL CHANGE

From KOP 8, the overall visual change that would result from the proposed project would be slightly adverse due to the low degrees of visual contrast and view blockage that would be caused by the upper portion of the HRSG stacks.

VISUAL IMPACT SIGNIFICANCE

When considered within the context of the low-to-moderate overall visual sensitivity of the existing landscape and viewing characteristics, the slightly adverse visual change that would be observed from Aqua Vista Park would cause an adverse but not significant visual impact.

KOP 9 – SAN FRANCISCO BAY

VISUAL RESOURCES Figure 15B presents a photosimulation of the proposed project as viewed from KOP 9 on San Francisco Bay, approximately one-half mile northeast of the project site. From this location, boaters on the Bay would have an unobstructed, direct, foreground view of the proposed project. The most notable change in the landscape would be the introduction of the new HRSG stacks and the water intake/discharge structure.

VISUAL CONTRAST

The proposed project would introduce prominent linear and geometric block forms with horizontal to vertical structural lines into the existing industrial setting. The introduced forms and lines would be similar to forms and lines already present in the landscape (adjacent power plant and commercial and industrial buildings). Though the greater vertical height of the HRSG stacks would contrast with the lower horizontal profile of the nearby commercial and industrial buildings, they would appear consistent with the existing Unit 3 stack. While the low horizontal form and lines of the water intake/discharge structure would appear consistent with nearby commercial and industrial structures, it would also contrast with the vertical form and lines of the existing and proposed stacks. The visual contrast that would be perceived from KOP 9 would be moderate.

PROJECT DOMINANCE

The foreground landscape visible from KOP 9 is dominated by the broad open expanse of San Francisco Bay. However, the middleground to background landscape is dominated by the Unit 3 stack and the maritime, industrial, and commercial facilities along Central Basin. Also noticeable in the background are

Bernal Heights to the southwest, and Potrero Hill and Sutro Tower to the west. With the exception of the existing power plant structures, the proposed power plant facilities would appear dominant over most other shoreline facilities. In addition to appearing moderate in size in the wide field of view, the proposed facilities would appear co-dominant with the existing power plant and Unit 3 stack, as well as the background forms of Potrero Hill and Bernal Heights.

VIEW BLOCKAGE

From Key Observation Point 9 the proposed HRSG structures and stacks (lower quality landscape features) would block from view a portion of Potrero Hill that is developed with high density residential structures. The two new stacks would also extend slightly above the ridgeline of Potrero Hill. This slight increase in view impairment would not substantially degrade the view from KOP 9 specifically, or San Francisco Bay in general and view blockage would be low.

OVERALL VISUAL CHANGE

The overall visual change caused by the proposed project would be moderately adverse primarily due to the moderate degree of visual contrast and co-dominance of the proposed HRSG structures that would be observed from KOP 9 and San Francisco Bay.

VISUAL IMPACT SIGNIFICANCE

When considered within the context of the moderate visual sensitivity of the existing landscape, the moderately adverse visual change that would be observed from the area represented by KOP 9 would cause an adverse but not significant visual impact.

OTHER VIEWING AREAS

SOUTH OF MARKET HIGHRISES

The proposed project would introduce into the South of Market highrise views additional, though subordinate, linear forms and vertical lines associated with the new HRSG stacks. Because these features would be minimally noticeable, the resulting change in views from this area would be neutral and the project would not cause significant visual impacts.

WARM WATER COVE PARK

The new HRSG structures would introduce prominent linear, complex forms with strong vertical lines into the foreground views from Warm Water Cove Park. The resulting moderate degree of visual contrast and view blockage that would result from these co-dominant structures would cause an adverse but not significant visual impact when viewed in the context of the existing industrial character of the proposed project site. Implementation of Applicant proposed Mitigation Measure VIS-4, as augmented by staff's recommended Condition of Certification VIS-3, would reduce the visual impact at Warm Water Cove Park.

NATIONAL REGISTER HISTORIC DISTRICT AT PIER 70

The proposed project would cause a slight increase in structural visual contrast and blockage of sky when viewed from the Historic District. The proposed HRSG structures would also appear subordinate-to-co-dominant in relationship to on-site and intervening foreground structures. However, within the context of existing industrial development both on-site and between the project site and the historic district, the adverse visual change would not cause a significant visual impact.

BAY TRAIL

The proposed project would cause a moderate increase in structural visual contrast and blockage of sky when viewed from specific viewpoints along the Bay Trail. However, within the context of existing industrial development both on the project site and adjacent to the Bay Trail, the adverse visual change attributable to the proposed project would cause an adverse but not significant visual impact. Additionally, implementation of Applicant proposed Mitigation Measure VIS-5, as augmented by staff's recommended Condition of Certification VIS-3, would further lessen the resulting visual impact.

LINEAR FACILITIES

The electrical transmission interconnection would be located underground for the most part within existing roads or rights-of-way. There would be no apparent evidence of the pipeline's presence and long-term project visibility would be limited to an occasional aboveground warning marker. Therefore, long-term visual impacts due to the operation of the linear facilities would be less than significant.

LIGHTING

Existing visible night lighting in the project vicinity is substantial, ranging from softer amber colored light to intense white light (see **VISUAL RESOURCES Figure 17A**). Sources of light include adjacent commercial buildings, industrial facilities (including the existing Potrero Power Plant), shipyards, and the American Industrial Center; automobile lights and street lights on nearby roads; and residences. Many of the lights are unshielded or occur in clusters, creating a more prominent visual source of light (SEP2000Dres1, Data Response No. 68). Vehicle head lights and tail lights on Interstate 280 are a prominent source of light in the area and appear as horizontal, bright, solid orange and red bands across the lower portion of the time-lapse photograph.

The proposed project would require nighttime lighting for operational safety and security and would increase the amount of lighting associated with the existing Potrero Power Plant site. There would be additional visible lighting associated with the project stacks, switchyard, and open site areas. Each of the KOPs evaluated in this analysis has a view of the project site during the night when the project lights would be visible. The intensity and noticeability of the lights would be closely correlated with the distance from the site. The closer the KOP to the project site, the more prominent and noticeable the project lighting and adjacent off-site lighting would be. The flashing red lights on the existing Unit 3 stack are presently the most noticeable lighting features at the site due to their height above all other sources of

adjacent and nearby lighting. Area lights within the switchyard and around access paths produce an amber color and are less visible because they are less concentrated. Additionally, light emanating from adjacent structures and facilities contributes to the visibility of the plant site (SEP2000Dres1, Data Response No. 69).

Project night lighting would be most visible from those KOPs closest to the project site due to the larger proportion of the nighttime landscape occupied by the project site and its associated lighting. As a result, night lighting would be most visible to KOP 1 (Potrero Hill Neighborhood – Watchman Way), KOP 2 (Potrero Hill Neighborhood – 20th and Mississippi Streets), and KOP 3 (I-280 / Third Street Neighborhood). However, when viewed from KOPs 2 and 3, the proposed lighting would be partially screened by adjacent buildings. Project night lighting would be considerably less noticeable from KOP 4 (Hunters Point Neighborhood), KOP 5 (Bernal Heights Neighborhood), KOP 6 (Bayview Neighborhood), and KOP 7 (Pacific Bell Park) due to the greater viewing distance, wider field of view and greater number of light sources. From Pacific Bell Park, nighttime noticeability of project site lighting would be minimal because the stadium lights would overwhelm all other sources of light. Although KOP 8 (Aqua Vista Park) is located in close proximity to the project site, the lower two-thirds of the project would be screened from view by intervening warehouse facilities. The most visible of the project light sources would be the flashing red lights on the proposed stacks. Project night lighting would also be very visible to KOP 9 (San Francisco Bay). However, there would be few nighttime viewers on this part of the Bay and the project lighting would be viewed within the context of substantial shoreline commercial and industrial lighting and a backdrop of residential and commercial lighting in the vicinity of Potrero Hill.

In general, the proposed project night lighting would be most visible from KOP 1, which represents the residential neighborhood in the vicinity of Watchman Way. This view area would have elevated and unobstructed views of the project night lighting. **VISUAL RESOURCES Figure 17B** presents a photosimulation of the proposed project with night lighting. As can be seen from the photosimulation, the additional project lighting would be consistent in appearance and intensity with that of existing lighting on and adjacent to the site. The most noticeable additions would be the flashing red warning lights on the two new stacks. Although additional lights would be added to the nighttime landscape, the existing lights on the Station A complex would be eliminated from view with removal of Station A. Overall, the addition of proposed project lighting is not expected to substantially change ambient lighting conditions as viewed from KOP 1 or other viewpoints. The resulting visual impact from project night lighting would be adverse but not significant. However, in order to reduce the offsite adverse impacts from project night lighting, the Applicant has stated the following:

“SECAL commits to providing lighting that does not exceed the intensity of (and would be similar in appearance to) the existing levels at the plant site. Lighting would be consistent with the prevailing amber color currently used, and would be limited to the lower building elevations. All new permanent lights would be shielded to prevent upward lighting, and wherever necessary to eliminate offsite

glare, and minimize offsite light spillage. Temporary lighting, using switches and/or motion detectors, would be used wherever possible for maintenance and security purposes. The lighting levels for this project would be kept to the minimum required for safety and maintenance of the plant during operation (SEP2000Dres1, Data Responses Nos. 70, 88, and 89)."

Although, the Federal Aviation Administration (FAA) has determined that the proposed project would not require marking or lighting for aviation safety (SEP2001Dresp4, Data Response No. 173), the Applicant has decided to retain the flashing, red warning lights on the stacks as an option to exercise at their discretion. This option could result in the introduction of unnecessary visual distraction into the nighttime views of the project site, Bay, and East Bay Hills beyond.

Therefore, because of this potential for the project to cause adverse nighttime lighting impacts, staff has expanded upon the Applicant's general commitment to the above quoted design measures with Condition of Certification VIS-2 (see below). Proper implementation of these measures would minimize lighting and keep lighting impacts to less than significant levels.

VISIBLE HRSG EXHAUST PLUMES

The proposed project would involve the addition of two new combined-cycle gas turbine/HRSG trains, each of which would be served by a separate stack (referred to in this discussion as HRSG stacks). An analysis of potentially visible plumes from the HRSG stacks was conducted by the Applicant using the Combustion Stack Visible Plume (CSVP) model. Staff reviewed that analysis and conducted an independent modeling analysis for comparison. The results of staff's analysis are presented here.

HRSG PARAMETERS

The Applicant modeled one HRSG exhaust condition for the entire year and stated in the response to Data Request #47 (SEP 2000Dresp1) that this represents a conservative condition that will likely overestimate plume occurrence. The AFC did not provide enough data to confirm the Applicant's contention that the conditions modeled were in fact conservative under all cold weather operating conditions. However, after a review of other similar projects, staff determined that the values are reasonable. Therefore the exhaust parameters modeled (see Table 2) should provide reasonable plume frequency results.

Table 2
HRSG Exhaust Parameters Provided by the Applicant

Parameter	HRSG Exhaust Parameters
Stack Height	54.88 meters
Stack Diameter	5.11 meters
Exhaust Temperature	361°K
Exit Velocity (calculated)	22.44 m/s
Exhaust mass flow rate	3,470,000 lbs./hr
Moisture Content (% by weight)	5.90%

METEOROLOGICAL DATA SUMMARY

The Applicant provided one year (1992) of meteorological data from San Francisco Airport (SFO). SFO was the closest location with meteorological data that included weather and visibility data. The data set provided by the Applicant to staff indicated daylight hours, fog hours, hours with visibility less than one mile, and hours with visibility less than three miles.

APPLICANT HRSG PLUME ANALYSIS SUMMARY

The Applicant modeled the HRSG stack conditions provided above with the CSVP model as explained in Data Request Response #47. Table 3 presents a summary of the Applicant's results and a comparison with the CEC modeled results using the CSVP model.

Table 3
Predicted HRSG Steam Plume Frequency Summary

	Applicant Results		CEC Results	
	Hours	Frequency	Hours	Frequency
All Hours	1,159	13.19%	462	5.26%
Daytime	366	8.21%	146	3.27%
Night	793	18.34%	316	7.31%
No Fog ^a	905	10.71%	281	3.33%
No Fog Day ^a	255	5.95%	75	1.75%
No Fog Night ^a	650	15.59%	206	4.94%

^a - Staff Results are no fog and no rain hours.

The Applicant did not provide frequency percentage results by season. However, it is likely that the winter condition daytime no fog condition plume frequencies using the Applicant's frequency data would be shown to be greater than 10%. Staff's analysis shows a considerably lower plume frequency than the Applicant's analysis. It is possible that the Applicant may have used an incorrect moisture content unit as input to the CSVP model.

The Applicant provided plume size characteristics based on 10% occurrence. Therefore, no data was provided for daytime and daytime no fog hours and no useful comparisons with staff's modeled data can be made. However, staff calculated the additional plume dimensions using the Applicant's meteorological data. The results are presented in Table 4.

Table 4
Staff Predicted HRSG Steam Plume Dimensions (meters) Using the Applicant's Meteorological Data (SFO 1992 MET DATA)

All Hours	Length	Height	Width
Maximum	771	390	44
Average	262	167	27
Median	205	162	26
Daylight Hours			
Maximum	762	263	43
Average	238	160	26

Median	193	159	26
Daylight No Fog No Rain Hours			
Maximum	762	254	43
Average	246	159	26
Median	195	157	26

The average and median values reflect the average and median dimensions when plumes occur.

STAFF CSVP MODELING ASSESSMENT

Staff first reviewed the conditions that the Applicant used for modeling the HRSG exhaust. The 1992 SFO meteorological data set provided by the Applicant was used to model the HRSG plume potential using the CSVP model. The modeling results using that data set are provided above in Table 3. Subsequently, staff obtained a six year (1990 to 1995) meteorological data set for SFO from the National Climatic Data Center (NCDC), which was formatted for use with CSVP. Staff believes that this multi-year data set provides more representative results. Using this data set a total of 3,803 hours were predicted for all 52,583 hours in the six years modeled. Of these 3,803 hours, 662 occurred during daylight and the other 3,141 occurred during nighttime hours. A summary of the predicted visible plume frequency is presented in Table 5.

Table 5
Staff Predicted HRSG Steam Plume Frequency Summary

Season	1990		1991		1992		1993		1994		1995		Totals	
All Hours	Hrs	Freq.	Hrs	Freq.	Hrs	Freq.	Hrs	Freq.	Hrs	Freq.	Hrs	Freq.	Hrs	Freq.
Fall	143	6.5%	108	4.9%	94	4.3%	102	4.7%	316	14.5%	97	4.4%	860	6.6%
Spring	38	1.7%	26	1.2%	1	0.0%	1	0.0%	76	3.4%	119	5.4%	261	2.0%
Summer	0	0.0%	7	0.3%	8	0.4%	0	0.0%	0	0.0%	29	1.3%	44	0.3%
Winter	521	24.1%	323	15.0%	431	19.7%	416	19.3%	537	24.9%	410	19.0%	2,638	20.3%
Total	702	8.0%	464	5.3%	534	6.1%	519	5.9%	929	10.6%	655	7.5%	3,803	7.2%
Daylight														
Fall	23	2.4%	11	1.13%	10	1.0%	12	1.2%	43	4.42%	13	1.3%	112	1.9%
Spring	6	0.5%	7	0.55%	0	0.0%	0	0.0%	7	0.55%	19	1.5%	39	0.5%
Summer	0	0.0%	0	0.00%	2	0.2%	0	0.0%	0	0.00%	5	0.4%	7	0.1%
Winter	97	10.1%	67	6.96%	84	8.6%	75	7.8%	104	10.80%	77	8.0%	504	8.7%
Total	126	2.8%	85	1.90%	96	2.1%	87	1.9%	154	3.44%	114	2.5%	662	2.5%
Daylight No Fog No Rain														
Fall	10	1.1%	3	0.33%	9	0.98%	9	1.0%	16	1.83%	3	0.35%	50	0.93%
Spring	5	0.4%	5	0.41%	0	0.00%	0	0.0%	6	0.49%	12	1.03%	28	0.39%
Summer	0	0.0%	0	0.00%	2	0.16%	0	0.0%	0	0.00%	3	0.24%	5	0.07%
Winter	70	8.4%	20	2.66%	34	4.30%	34	4.3%	38	4.85%	34	4.91%	230	4.95%
Total	85	2.0%	28	0.69%	45	1.07%	43	1.0%	60	1.45%	52	1.31%	313	1.27%

The frequencies predicted by staff using the CSVP model are less than those predicted by the Applicant and they are similar to those predicted by staff using the Applicant's 1992 meteorological data set. The results presented in Table 5 show seasonal variability regarding plume potential. However, plumes are predicted to occur less than 9% of the time for all seasons during daylight no fog no rain hours.

Cool ambient temperatures with high relative humidities characterize the ambient conditions that occur during predicted plume events. The range of ambient

conditions where HRSG plumes are predicted are presented in Table 6 and the CSVP predicted plume size dimensions are provided in Table 7.

Table 6
Ambient Conditions During Hours with Predicted HRSG Plumes
SFO Meteorological Data 1990 - 1995

All Hours	Temperature	Relative Humidity
Maximum	54°F	100%
Minimum	27°F	32%
Average	45°F	92%
Median	45°F	93%

Table 7
Staff Predicted HRSG Steam Plume Dimensions (meters)

All Hours	Length	Height	Width
Maximum	1339	636	70
Average	390	165	28
Median	290	165	25
Daylight Hours			
Maximum	423	636	58
Average	174	184	26
Median	167	143	24
Daylight Hours No Fog No Rain			
Maximum	392	603	56
Average	175	189	27
Median	172	160	25

The average and median values reflect the average and median dimensions when plumes occur.

CONCLUSIONS

Visible plumes from the HRSG exhaust stacks would occur from the proposed project during periods of cold weather or cool wet weather. The actual frequency of occurrence would vary from year to year. HRSG plume formation can occur during the daytime or nighttime. However, based on the modeling results, the conditions necessary for plume formation are most prevalent during nighttime hours. For all daylight hours predicted to have plumes, 83% were predicted to occur before 10 AM. Under no fog no rain daylight hour conditions, 93% were predicted to occur before 10 AM. The results of the staff CSVP modeling analysis show less frequent plumes than the Applicant. This difference may be due in part to the units of moisture content used in the model.

The average frequency of plumes predicted to occur during daytime under all viewing conditions is less than 9%. For two years (1990 and 1994) the frequency of plume formation during winter slightly exceeded 10%. However, during periods of high visibility, defined as daylight no fog no rain hours, the predicted frequency of plume occurrence is less than 5% for each season in the six years of meteorological

data modeled with the exception of the 1990 winter season when plume frequency was 8.4%. Given the relatively low frequency of plume formation (less than 5%) under conditions when the plumes would be most visible, plume formation would not cause significant visual impacts.

CONSIDERATION OF IMPACTS IN RELATION TO CEQA SIGNIFICANCE CRITERIA

This analysis considered the potential impacts of the proposed project in relation to the four significance criteria for visual resource impacts listed in Appendix G of the CEQA Guidelines, under Aesthetics, specified below.

1. Would the project have a substantial adverse effect on a scenic vista?

Panoramic vistas are available to nearby residents and motorists on project vicinity roads. Views from these areas as well as the Potrero Hill area, which is considered a vista point, would be only slightly affected as the additional visual contrast, and view blockage caused by the new facilities would be partially offset by the removal of the existing Station A complex. The proposed project would not have a substantial effect on any scenic vista and would not cause significant visual impacts in regard to this criterion.

2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

The proposed project site is located within the viewshed of two road segments I-280 and I-80 (Bay Bridge), that have been designated as eligible for state Scenic Highway status. As part of the proposed project, the historic Station A complex would be removed. However, the project site would not be prominent in views from these eligible roadways and Station A must be removed for safety reasons. Also, the removal of Station A will open up views through the site, adding new sightlines from Potrero Hill to the Bay. Therefore, the project would not cause significant visual impacts in regard to this criterion.

3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

As discussed in a previous section of this analysis, the proposed project would introduce prominent structures of industrial character into the foreground to middleground of views from nearby residential areas, parks, and recreation areas. Residents and recreationists are considered highly sensitive to landscape change. While the proposed project would not significantly impact the existing visual character or quality when viewed from these sensitive areas, the project would adversely effect the existing view to the north from Warm Water Cove Park, immediately adjacent and to the south of the project site. However, implementation of the Applicant proposed Mitigation Measure VIS-4, as expanded by staff's recommended Condition of Certification VIS-3 (see below), would lessen the adverse visual impact.

4. Would the project create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?

The project has the potential to create a new source of substantial light that would adversely affect nighttime views in the area. However, the exterior lighting control measures proposed by the Applicant and expanded by staff (see below) would ensure that lighting impacts would be less than significant.

CUMULATIVE IMPACTS

Cumulative impacts to visual resources could occur where project facilities or activities (such as construction) occupy the same field of view as other built facilities or impacted landscapes. It is also possible that a cumulative impact could occur if a viewer's perception is that the general visual quality of an area is diminished by the proliferation of visible structures (or construction effects such as disturbed vegetation), even if the new structures are not within the same field of view as the existing structures. The significance of the cumulative impact would depend on the degree to which (1) the viewshed is altered; (2) visual access to scenic resources is impaired; (3) visual quality is diminished; or (4) the project's visual contrast is increased.

Potential development within the project vicinity includes the redevelopment of over 600 acres in Mission Bay. This redevelopment would include commercial, residential, and industrial uses north of the proposed project site. Ground-level or lower level viewpoints close to either the proposed project or the Mission Bay redevelopment area would not likely have both projects in the same view due to screening by intervening structures. From more distant viewing opportunities, the two projects would be substantially less noticeable, becoming absorbed in the structural mosaic comprising the panoramic urban landscape. Therefore, any noticeable cumulative impact between these two projects would be adverse but not significant.

Also, the San Francisco Redevelopment Agency is currently preparing, with input from the community, a conceptual plan for Bayview Hunters Point, which encompasses approximately 2,400 acres but excludes the India Basin Industrial Park. To date, no specific plan has been approved. Viewpoints that would encompass both projects would necessarily be a substantial distance from one or both of the projects. These more distant viewing opportunities of one or both of the projects present a similar viewing circumstance as that describe previously for the Mission Bay project. One or both of the projects would be substantially less noticeable in the panoramic urban landscape and any resulting cumulative impact would be at most, adverse but not significant.

FACILITY CLOSURE

There are at least three circumstances in which a facility closure can take place, planned closure, unexpected temporary closure and unexpected permanent closure.

Planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence. The closure plan that the project owner is required to prepare should address removal of the power plant structures.

Unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster, or an emergency. No special conditions regarding visual resources are expected to be required to address temporary closure.

Unexpected permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. The contingency plan that the project owner is required to prepare should address removal of the power plant structures.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

STATE

Table 8 provides a preliminary listing of the applicable LORS of the Bay Conservation and Development Commission and the California State Department of Transportation (Caltrans). Relevant policies pertain to the enhancement and/or maintenance of visual quality and the protection of views. The proposed project has been found to be consistent with all eight of the state policies and programs referenced in Table 8.

LOCAL

Table 8 also provides a preliminary listing of the applicable LORS of the City and County of San Francisco. Relevant policies pertain to the enhancement and/or maintenance of visual quality, preservation of historic and waterfront character, consistency of architectural design, and the protection of views. The proposed project has been found to be consistent with twenty-four of the local policies referenced in Table 8. In two additional cases, the project was found to be partially consistent with local LORS, and in one case the project was found to be inconsistent with to other local LORS. In all cases, following implementation of the Applicant and staff proposed mitigation measures, the proposed project would be fully consistent with all local LORS.

Table 8
Proposed Project's Consistency with
State and Local LORS Applicable to Visual Resources

LORS	Consistency Determination Before Mitigation	Basis for Consistency
VISUAL RESOURCES	4.12 - 42	May 31, 2001

Policy No.	Policy Description		
BAY CONSERVATION AND DEVELOPMENT COMMISSION (BCDC) SAN FRANCISCO BAY PLAN			
Policy 1	To enhance the visual quality of development around the Bay and to take maximum advantage of the attractive setting it provides, the shores of the Bay should be developed in accordance with the Public Access Guidelines.	YES	The Public Access Guidelines require maximum feasible access along the waterfront, except where public access is clearly inconsistent with the project because of public safety considerations. The proposed project would prohibit public access to the site and waterfront for safety reasons. However, the Applicant has committed to improving public access to the waterfront through the implementation of landscaping in Warm Water Cove Park (Applicant Mitigation Measure VIS-4 and staff recommended Condition of Certification VIS-3).
Policy 2	All bayfront development should be designed to enhance the pleasure of the user or viewer of the Bay. Maximum efforts should be made to provide, enhance, or preserve views of the Bay and shoreline, especially from public areas, the Bay, and the opposite shore. To this end, planning of waterfront development should include participation by professionals who are knowledgeable of the Commission's concerns, such as landscape architects, urban designers, or engineers and professionals in other fields.	YES	The project with mitigation would comply with Policy 2 and Policy 4 (see below) due to efforts to minimize blockage of views to the Bay, and to reflect the historic character of the industrial waterfront. Landscape architects have been involved in the development of these design mitigations. The modified design of the proposed project (Applicant Mitigation Measure VIS-6 and staff's recommended Condition of Certification VIS-1) would provide a less utilitarian appearance to the lower power plant facilities and streetscape. Sightlines to the Bay would be retained between the HRSG structures, and some additional minor views of the Bay would be obtained through the removal of Station A. Furthermore, the project would be evaluated by the appropriate City and County of San Francisco (CCSF) planning officials to determine exact design requirements prior to construction.
Policy 4	Structures and facilities that do not take advantage of or visually complement the Bay should be located and designed so as not to impact visually on the Bay and shoreline. In particular, parking areas should be located away from the shoreline. However, some small parking areas for fishing access and Bay viewing may be allowed in exposed locations.	YES	See Policy 2
Policy 8	Shoreline developments should be built in clusters, leaving open areas around them to permit more frequent views of the Bay. Developments along the shores of tributary waterways should be designed to preserve and enhance views along the waterways, so as to provide maximum visual contact with the Bay.	YES	The proposed project includes the development of new power generation facilities inland from the existing power plant. By locating the new facilities inland, and designing these new structures with the minimum feasible heights, the project would retain substantial visual contact with the Bay. The cooling water intake structure along the shoreline would be visible from the Bay but would be screened from inland

Table 8
Proposed Project's Consistency with
State and Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before Mitigation	Basis for Consistency
Policy No.	Policy Description		
			views by existing shoreline structures. Also, removal of the Station A complex will open up additional sightlines to the Bay.
Policy 10	Towers, bridges, or other structures near or over the Bay should be designed as landmarks that suggest the location of the waterfront when it is not visible, especially in flat areas. But such landmarks should be low enough to assure the continued visual dominance of the hills around the Bay.	YES	The proposed project is not being designed as a waterfront landmark. However, as discussed in previous sections, project dominance would range from subordinate to co-dominant and would not compromise the visual dominance of the hills around the Bay.
Policy 13	Local governments should be encouraged to eliminate inappropriate shoreline uses and poor quality shoreline conditions by regulation and by public actions (including development financed wholly or partly by public funds). The Commission should assist in this regard to the maximum feasible extent by providing advice on Bay-related appearance and design issues, and by coordinating the activities of the various agencies that may be involved with projects affecting the Bay and its appearance.	YES	The proposed project has been located at an appropriate site with similar visual characteristics. Also, further consultation with the BCD and the CCSF Planning Department would occur prior to project construction as described in Applicant Mitigation Measures VIS-1 and VIS-2.
Policy 14	Views of the Bay from vista points and roads should be maintained by appropriate arrangements and heights of all developments and landscaping between the view areas and the water. In this regard, particular attention should be given to all waterfront locations, areas below vista points, and areas along roads that provide good views of the Bay for travelers, particularly areas below roads coming over ridges and providing a "first view" of the Bay.	YES	The proposed project would not cause a substantial blockage of views from local roads or Interstates 80 and 280 in the project vicinity. Views from the Potrero Hill area, which is considered a vista point, would be only slightly affected as the additional blockage of views caused by the new facilities would be partially offset by the removal of the existing blockage caused by the Station A complex.
California State Department of Transportation (Caltrans)			
Scenic Highway Program	Segments of Interstate-80 and Interstate-280 near the proposed project are eligible for scenic highway designation. Protection of scenic qualities along designated scenic highways is the responsibility of the local agency, via an approved scenic corridor protection plan and local	YES	No local agency has applied to Caltrans to designate these sections of highway as Scenic and therefore, no specific policies have been

Table 8
Proposed Project's Consistency with
State and Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before Mitigation	Basis for Consistency
Policy No.	Policy Description		
	ordinances.		implemented to protect scenic qualities in these corridors. However, views toward the project from either the Bay Bridge (I-80) or I-280 are for the most part distant or partially blocked. No significant visual impacts would occur to the views from either of these highway segments.
City and County of San Francisco – Waterfront Land Use Plan			
Policy 1, View Sites	Establish new views at specific points or areas that afford exceptional views of the Bay, waterfront, and City.	YES	The proposed project is not located on a site selected for a new view of the City or Bay, as designated with the Waterfront Design and Access Element.
Policy 2, Street Views	Streets connecting to the waterfront should have views of the Bay, historic structures, or architecture that provide a waterfront identity.	YES	The existing and future street views protected within the Waterfront Design and Access Element are north of the proposed project site. The southernmost protected street view is on 20 th Street, looking toward the Bay (east). Views to the southeast, toward the proposed project, would be partially to fully screened by adjacent structures. For those views where the project structures would be visible, the slight additional blockage of Bay views caused by the new facilities would be partially offset by the removal of the existing blockage caused by the Station A complex.
City and County of San Francisco – San Francisco Master Plan			
Objective 1, Policy 1	Encourage development, which provides substantial net benefits and minimizes undesirable consequences. Discourage development, which has substantial undesirable consequences that cannot be mitigated.	YES	With implementation of both Applicant and staff mitigation measures, the proposed project would not cause substantial undesirable visual consequences or significant visual impacts.
Objective 1, Policy 2	Assure that all commercial and industrial uses meet minimum reasonable performance standards.	YES	The proposed project would have an industrial appearance consistent with the industrial nature of the existing power plant and surrounding historic waterfront area.
City and County of San Francisco – Recreation and Open Space Element			
Objective 3, Policy 1	Assure that new development adjacent to the shoreline capitalizes on its unique waterfront location, considers shoreline land use provisions, improves visual and	YES	The proposed project is appropriately located at an existing power plant site with similar visual characteristics. The Applicant's commitment to coordinate with CCSF and BCDC officials (Applicant

Table 8
Proposed Project's Consistency with
State and Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before Mitigation	Basis for Consistency
Policy No.	Policy Description		
	physical access to the water and conforms with urban design policies.		Mitigation Measures VIS-1 and VIS-2), as augmented by staff's recommendations, would help to ensure that the proposed project would meet urban design requirements and shoreline land use provisions. The design treatment envisaged in Applicant Mitigation Measure VIS-6, as augmented by staff's recommended Condition of Certification VIS-1, would reflect the historic character of the industrial waterfront area. Further, the landscaping of Warm Water Cove Park as described in Applicant Mitigation Measure VIS-4, and augmented by staff's recommended Condition of Certification VIS-3, would partially mitigate adverse visual effects by enhancing physical access to the Bay. The removal of the view blockage associated with the Station A complex would also open up new sightlines to the Bay.
City and County of San Francisco – Urban Design Element			
Objective 1, Policy 1	Recognize and protect major views in the city, with particular attention to those of open space and water.	YES	Important views near the proposed project that are identified in the Master Plan include Hunters Point and Potrero Hill. Significant visual impacts would not occur to either of these areas as discussed previously in this analysis. Although a slight increase in view blockage would occur for some views from Potrero Hill, the view blockage would be partially offset by the elimination of the blockage caused by the existing Station A. Implementation of both Applicant Mitigation Measures (VIS-1 and VIS-6) and staff recommended Condition of Certification VIS-1 would further reduce the proposed project's adverse but not significant visual impacts on views from these areas.
Objective 1, Policy 3	Recognize that buildings, when seen together, produce a total effect that characterizes the city and its districts.	YES	The proposed project would not change the character of the predominantly industrial waterfront. The design of the surface/architectural treatment of the HRSG units (Applicant Mitigation Measure VIS-6 and staff's recommended Condition of Certification VIS-1) would reflect the historical industrial appearance of the surrounding area.
Objective 2, Policy 3	Avoid encroachment on San Francisco Bay that would be inconsistent with the Bay Plan or the needs of the city's residents.	YES	The proposed project includes a cooling water intake and discharge structure that would be located along the shoreline of the Bay. As discussed above, the proposed project would be consistent

Table 8
Proposed Project's Consistency with
State and Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before Mitigation	Basis for Consistency
Policy No.	Policy Description		
			with the Bay Plan policies relevant to visual resources. Also, the intake/discharge structure would be minimally visible to land based views, and would therefore, not be inconsistent with the needs of the city's residents.
Objective 2, Policy 6	Respect the character of older development nearby in the design of new buildings.	YES	The proposed project design would appear consistent with the visual characteristics already established on the site by the existing power plant. Also, the proposed HRSG structure surface/architectural treatment (Applicant Mitigation Measure VIS-6 and staff's recommended Condition of Certification VIS-1) would be designed to reflect an industrial, yet historic character (derived from local historical precedents) to complement nearby buildings and the waterfront. The proposed project stacks would also be shorter than the existing stack, ensuring that the new facilities would not appear dominant in the area. In summary, consistency with these policies would be achieved through implementation of the Applicant's proposed Mitigation Measures as augmented by staff's recommendations.
Objective 2, Policy 7	Recognize and protect outstanding and unique areas that contribute in an extraordinary degree to San Francisco's visual form and character.	YES	
Objective 3, Policy 1	Promote harmony in the visual relationships and transitions between new and older buildings.	YES	
Objective 3, Policy 2	Avoid extreme contrasts in color, shape and other characteristics, which will cause new buildings to stand out in excess of their public importance.	YES	
Objective 3, Policy 3	Promote efforts to achieve high quality of design for buildings to be constructed at prominent locations.	YES	
Objective 3, Policy 4	Promote building forms that will respect and improve the integrity of open spaces and other public areas.	NO	Warm Water Cove Park is located south of the project site. The proposed project would introduce prominent complex forms with strong vertical lines into the view from the park. The resulting moderate degree of visual contrast and view blockage would cause an adverse but not significant visual impact. However, landscape improvements made as part of Applicant Mitigation Measure VIS-4, as augmented by staff's recommended Condition of Certification VIS-3, would improve visual quality and integrity of the open space at the park.
Objective 3, Policy 5	Relate the height of buildings to important attributes of the city pattern and to the height and character of existing development.	PARTIALLY	The Urban Design Element outlines recommendations for height and bulk requirements throughout the city. The range suggested for maximum heights is 41-88 feet; the range for bulk (front and diagonal dimensions) would depend on building height. With a building height exceeding 60 feet, the maximum plan dimension recommended is 250 feet. The maximum diagonal plan dimension recommended is 300 feet. Although, the
Objective 3, Policy 6	Relate the bulk of buildings to the prevailing scale of development to avoid an overwhelming or dominating appearance in new construction.		

Table 8
Proposed Project's Consistency with
State and Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before Mitigation	Basis for Consistency
Policy No.	Policy Description		
			proposed project would exceed these dimensions, in the context of the adjacent power plant and industrial structures, the proposed project would not appear overwhelming nor would it dominate the existing industrial waterfront landscape.
Objective 3, Policy 7	Recognize the special urban design problems posed in development of large properties.	YES	The surface/architectural treatment proposed as part of the Applicant's Mitigation Measure VIS-6, as augmented by staff's recommended Condition of Certification VIS-1, would help to mitigate the visual contrast and prominence of the new structures.
Objective 4, Policy 12	Install, promote, and maintain landscaping in public and private areas.	YES	Although the proposed project does not include on-site landscaping, it will provide for the off-site landscaping of Warm Water Cove as described in Applicant Mitigation Measure VIS-6 and augmented by staff's recommended Condition of Certification VIS-3. Landscaping will also be provided along 23 rd Street under Applicant Mitigation Measures VIS-5.
Objective 4, Policy 14	Remove and obscure distracting and cluttering elements.	YES	The proposed project will include the removal of the Station A structures and the shop building. The project will also include the introduction of several new structures. Some of these structures will be at least partially screened by the existing facilities. Overall, the proposed project will not cause the introduction of distracting or cluttering elements.
Objective 4, Policy 15	Protect the livability and character of residential properties from intrusion of incompatible new buildings.	YES	The proposed project is not located within a residential area and the nearest residence is approximately 1,000 feet distant from the site. At this distance, the proposed facilities would not cause any shadowing over residences. Additionally, lighting for the new facilities would be effectively controlled with implementation of the Applicant's Mitigation Measure VIS-3, as augmented by staff's recommended Condition of Certification VIS-2. Overall, the proposed facilities would be consistent with existing facilities on the site and would not adversely affect either the livability or character of nearby residential properties.
City and County of San Francisco – Central Waterfront Area Plan			

Table 8
Proposed Project's Consistency with
State and Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before Mitigation	Basis for Consistency
Policy No.	Policy Description		
Objective 10, Policy 1	Reinforce the visual contrast between the waterfront and hills by limiting the height of structures near the shoreline. Relate the height and bulk of new structures away from the shoreline to the character of the topography and existing development.	PARTIALLY	The proposed project will include the introduction of two 180-foot tall HRSG exhaust stacks in close proximity to the shoreline. However, these new structures would appear consistent with the existing Unit 3 structures in terms of character and would be subordinate in terms of scale.
Objective 10, Policy 2	Protect and create views of the downtown skyline and the Bay. Design and locate new development to minimize obstruction of existing views.	YES	The proposed facilities would fit within the industrial context of the area and would minimize obstruction of views to the Bay. Additionally, removal of the existing Station A complex would open up new sightlines to the Bay.
Objective 10, Policy 3	Encourage the rehabilitation of architecturally or historically significant buildings with reuse potential	YES	There are no opportunities for reuse of older buildings as part of this project. The existing Station A complex is being removed for safety reasons.
Objective 10, Policy 4	Encourage the inclusion of recreational facilities, outdoor leisure areas, and public open spaces in new private developments.	YES	Although the proposed project does not include recreational facilities or open space, implementation of Applicant Mitigation Measure VIS-4, as augmented by staff's recommended Condition of Certification VIS-3, would provide for landscaping and recreational improvements to Warm Water Cove Park.
Objective 16, Policy 2	Assure that any power plant expansion on the Pacific Gas and Electric Company site will provide additional employment and will not adversely affect the environment.	YES	With implementation of the Applicant's proposed mitigation measures as augmented by staff's mitigation measures and recommendations, the proposed project would not cause any significant visual impacts.
Objective 17, Policy 1	Maintain and improve existing recreational improvements at Warm Water Cove and expand to adjacent waterfront properties. Develop a waterfront picnic area and fishing pier at 24 th Street. Provide public access along the north side of the Cove and construct a fishing quay at the Bay. Shield the recreation area from surrounding industrial uses by providing attractive landscaping.	YES	The proposed project with its associated mitigation measures, as augmented by staff's recommendations, would achieve compliance with this policy. Applicant proposed Mitigation Measure VIS-4, as augmented by staff's recommended Condition of Certification VIS-3, would create landscaping within Warm Water Cove Park to visually shield the park from the project and nearby industrial uses.
Objective 18 Policy 1	Minimize blockage of private and public views and maintain, to the extent feasible, sightlines from Potrero Hill and Mission Bay to the waterfront and downtown.	YES	The proposed project results in a slight increase in view blockage of the Bay and the East Bay Hills when viewed from Potrero Hill. However, this impact is partially (though not completely) mitigated by elimination of the view blockage caused by the existing Station A complex which also opens up additional sightlines to the Bay from

Table 8
Proposed Project's Consistency with
State and Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before Mitigation	Basis for Consistency
Policy No.	Policy Description		
			Potrero Hill. The resulting view blockage visual impact, while adverse, would not be significant.

MITIGATION

APPLICANT'S PROPOSED MITIGATION MEASURES

The Applicant has proposed six mitigation measures to be incorporated into the project design to minimize visual impacts associated with the operation of the facility:

VIS-1. The project will meet or exceed the applicable City and County of San Francisco (CCSF) Design Guidelines for project features such as structures, signs, and landscaping. These guidelines are project-specific and therefore, will be evaluated by the appropriate CCSF planning officials to determine exact design requirements prior to construction.

VIS-2. The project proponent will consult with the Bay Conservation and Development Commission (BCDC) to ensure coordinated compliance with BCDC project-specific requirements and those of CCSF.

VIS-3. Exterior lighting will be limited to areas required by regulations, operations, and safety. Low-intensity lights will be used where allowed by regulations (e.g., site perimeter and parking areas). High-intensity lighting will be limited to areas where such lighting is necessary for operations and safety concerns (e.g., checking plant equipment). A higher proportion of lighting will be directed and/or shielded to reduce glare towards sensitive viewers.

VIS-4. Offsite landscaping within Warm Water Cove Park, including substantial planting of trees and shrubs, will be used to filter and screen views toward the proposed project, and instead focus views on the Bay.

VIS-5. Additional landscaping and provision of street trees along 23rd Street east of Third Street to improve the approach to the plant site and to help screen the switchyard facilities at the west end of the site.

VIS-6. Surface treatment of the HRSG buildings will be provided so as to reduce their visual contrast and utilitarian appearance, and improve their compatibility with the historic and developing character of the industrial

waterfront neighborhood. The HRSG stacks would be treated with a low reflectance surface and colored to darken them to a medium value, similar to the colors of the existing stack. The west and south faces of the HRSG buildings would receive surface color and/or limited architectural treatment on the lower two-thirds of the structures to provide colors, details, and other urban design qualities consistent with the historic industrial setting (e.g. reflecting the colors and textures of Station A) and waterfront locations. An architectural historian with local expertise should be retained to provide advice on design consistency.

ADDITIONAL MITIGATION

Energy Commission staff generally agrees with the Applicant's proposals. However, staff's position is that these proposals need to be more precisely developed and in some cases expanded in conditions of certification, which staff proposes below. In particular, all aspects of Mitigation Measures VIS-1, VIS-2, VIS-4, VIS-5, and VIS-6 will require review and approval by the Bay Conservation and Development Commission and/or the City and County of San Francisco as appropriate.

In addition, staff proposes one additional mitigation measure:

VIS-7 During project construction, all high-profile construction equipment, including cranes, are to be lowered and/or relocated on-site when not in use in order to reduce the potential for adverse visual impacts.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff concludes that without mitigation the proposed project would cause adverse but not significant visual impacts. However, effective implementation of the Applicant and staff proposed mitigation measures, and staff's recommended conditions of certification, would reduce the adverse visual impacts that would be caused by the project. Staff also concludes that the proposed mitigation, as augmented by staff's recommended conditions of certification, would bring the project into compliance with applicable laws, ordinances, regulations, and standards regarding visual resources.

RECOMMENDATIONS

The Energy Commission should adopt the following conditions of certification if it approves the project.

PROPOSED CONDITIONS OF CERTIFICATION

VIS-1 Prior to first turbine roll, the project structures, buildings, and stacks shall receive appropriate surface treatment with respect to color, texture, and limited architectural design that minimize visual intrusion and contrast by

blending the proposed facilities with the surrounding landscape. This is to be accomplished in a fashion that is consistent with the developing and historic waterfront industrial setting, including any necessary perimeter brick wall details that will provide continuity with streetscaping for pedestrians. An architectural historian with local expertise shall be retained to provide advice on design consistency.

Protocol: The project owner shall submit a treatment plan for the project to the California Energy Commission Compliance Project Manager (CPM) for review and approval. The treatment plan shall include:

- specifications, and 11" x 17" color simulations at life-size scale, of the treatment proposed for use on project structures, including structures treated during manufacture;
- a list of each major project structure, building, and tank, specifying the treatment(s) proposed for each item;
- documentation that a non-reflective finish will be used on all project elements visible to the public;
- a detailed schedule for completion of the treatment;
- a procedure to ensure proper treatment maintenance for the life of the project, and
- evidence that the treatment plan has been reviewed by the Bay Conservation and Development Commission and the City and County of San Francisco.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall submit a revised plan to the CPM.

After approval of the plan by the CPM, the project owner shall implement the plan according to the schedule and shall ensure that the treatment is properly maintained for the life of the project.

For any structures that are treated during manufacture, the project owner shall not specify the treatment of such structures to the vendors until the project owner receives notification of approval of the treatment plan by the CPM.

The project owner shall not perform the final treatment on any structures until the project owner receives notification of approval of the treatment plan from the CPM.

Verification: At least 60 (sixty) days prior to ordering the first structures that are color treated during manufacture, the project owner shall submit its proposed plan to the CPM for review and approval.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification, the project owner shall submit to the CPM a revised plan.

Not less than thirty (30) days prior to first turbine roll, the project owner shall notify the CPM that all structures treated during manufacture and all structures treated in the field are ready for inspection.

The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.

VIS-2 Prior to first turbine roll, the project owner shall design and install all lighting such that light bulbs and reflectors are not visible from public viewing areas and illumination of the vicinity and the nighttime sky is minimized during both project construction and operation.

Protocol: The project owner shall develop and submit a lighting plan for the project to the CPM for review and approval. The lighting plan shall require that:

- Lighting is designed so that exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized. The design of this outdoor lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary;
- High illumination areas not occupied on a continuous basis such as maintenance platforms or the main entrance are provided with switches or motion detectors to light the area only when occupied;
- A lighting complaint resolution form (following the general format of that in Attachment 1) shall be used by plant operations, to record all lighting complaints received and document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

Lighting shall not be installed before the plan is approved. The project owner shall notify the CPM when the lighting has been installed and is ready for inspection.

Verification: At least 90 (ninety) days before ordering the exterior lighting, the project owner shall provide the lighting plan to the CPM for review and approval.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification the project owner shall submit to the CPM a revised plan.

The project owner shall notify the CPM within seven days of completing exterior lighting installation that the lighting is ready for inspection.

VIS-3 The project owner shall provide landscaping and screening that meets the requirements of the Bay Conservation and Development Commission and the City and County of San Francisco. The landscaping and screening plan (plan) must be effective in screening views toward the proposed project from Warm Water Cove Park. The plan must also provide for additional landscaping and the planting of trees along 23rd Street east of Third Street to improve the approach to the plant site and to help screen the switchyard facilities at the west end of the site.

Protocol: The project owner shall submit a landscaping plan to the CPM for review and approval. The plan shall include:

- 1 11x17 color simulations of the proposed landscaping showing landscaping at maturity and at five years if the time to maturity is longer than five years;
- A detailed list of plants to be used and times to maturity; and
- Evidence that the plan has been reviewed by, and meets the requirements of the Bay Conservation and Development Commission and the City and County of San Francisco.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the submittal, the project owner shall submit to the CPM a revised plan.

The project owner shall not implement the plan until the project owner receives approval of the submittal from the CPM.

Verification: At least 60 (sixty) days prior to installing the landscaping, the project owner shall submit the plan to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within 7 (seven) days after completing installation of the landscaping, that the landscaping is ready for inspection.

VIS-4 During project construction, the project owner shall lower and/or relocate on-site, all high-profile construction equipment, including cranes, when not in use in order to reduce the potential for adverse visual impacts.

Protocol: The project owner shall submit a construction equipment management plan (plan) to the CPM for review and approval. The plan must identify all high-profile equipment to be used during construction and the conditions under which the equipment will be lowered and/or relocated on-site.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the submittal, the project owner shall submit to the CPM a revised plan.

The project owner shall not implement the plan until the project owner receives approval of the submittal from the CPM.

Verification: At least 60 (sixty) days prior to start of construction, the project owner shall submit the plan to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM when the first equipment subject to the plan arrives on site.

VIS-5 All fencing for the project shall be non-reflective.

Protocol: Prior to ordering the fencing the project owner shall submit to the CPM for review and approval the specifications for the fencing documenting that such fencing will be non-reflective.

If the CPM notifies the project owner that revisions of the specifications are needed before the CPM will approve the submittal, the project owner shall submit to the CPM revised specifications.

The project owner shall not order the fencing until the project owner receives approval of the fencing submittal from the CPM.

The project owner shall notify the CPM within one week after the fencing has been installed and is ready for inspection.

Verification: Prior to first turbine roll and at least 30 (thirty) days prior to ordering the non-reflective fencing, the project owner shall submit the specifications to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the fencing that the fencing is ready for inspection.

REFERENCES

- MIRANT (Mirant Corp.). 2001f. Supplemental Information to the Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Addresses options for Visual Resources Key Observation Points 1B and 3. Submitted to the California Energy Commission, May 8, 2001.
- MIRANT (Mirant Corp.). 2001g. Amendment to the Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Addresses removal of the façade from the proposed project. Submitted to the California Energy Commission, April 20, 2001.
- MIRANT (Mirant Corp.). SEP2001Dresp4. Mirant's response to staff Data Requests, Set 4, Nos. 170 through 194, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission March 26, 2001.
- SECAL (Southern Energy California). 2001a. Amendment to the Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Addresses the demolition of six existing structures. Submitted to the California Energy Commission, January 19, 2001.
- SECAL (Southern Energy California). 2000a. Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, May 31, 2000.
- SECAL (Southern Energy California). 2000b. Supplemental Information in Response to CEC Data Adequacy Request, Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, August 31, 2000.
- SECAL (Southern Energy California). SEP2000DResp1. Southern Energy California response to staff Data Requests, Set 1, Nos. 1 through 139, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission on December 7, 2000.
- Smardon, Richard C., James E. Palmer, and John P. Felleman. 1986. *Foundations for Visual Project Analysis*. John Wiley & Sons. New York.
- U.S. Department of Agriculture, Forest Service. 1995. *Landscape Aesthetics, A Handbook for Scenery Management*. Agriculture Handbook Number 701. USDA, Forest Service.
- U.S. Department of Interior (USDI), Bureau of Land Management (BLM). 1986a. *Visual Resource Inventory Manual*. USDI, BLM.
- USDI, BLM. 1986b. *Visual Contrast Rating Manual*. USDI, BLM.

USDI, BLM. 1984. *Visual Resource Management Manual*. USDI, BLM.

ATTACHMENT 1

LIGHTING COMPLAINT RESOLUTION FORM

POTRERO POWER PLANT PROJECT San Francisco County, California
Complainant's name and address:
Phone number:
Date complaint received:
Time complaint received:
Nature of lighting complaint:
Definition of problem after investigation by plant personnel:
Date complainant first contacted:
Description of corrective measures taken:
Complainant's signature: _____ Date: _____
Approximate installed cost of corrective measures: \$ _____
Date installation completed:
Date first letter sent to complainant: _____ (copy attached)
Date final letter sent to complainant: _____ (copy attached)
This information is certified to be correct:
Plant Manager's Signature: _____

(Attach additional pages and supporting documentation, as required.)

APPENDIX A
POTRERO POWER PLANT UNIT 7 PROJECT
STAFF ASSESSMENT - VISUAL ANALYSIS SUMMARY

VIEWPOINT		EXISTING VISUAL SETTING								VISUAL IMPACT					IMPACT SIGNIFICANCE		
Key Observation Point (KOP)	Description	Visual Quality	Viewer Concern	Viewer Exposure					Overall Visual Sensitivity	Description	Visual Contrast	Project Dominance	View Blockage	Overall Visual Change	Impact Significance Before Mitigation	Mitigation / Conditions	Impact Significance After Mitigation
				Visibility	Distance Zone	Number of Viewers	Duration of View	Overall Viewer Exposure									
KOP 1 POTRERO HILL WATCHMAN WAY NEIGHBORHOOD	View to east from the cul-de-sac on Watchman Way.	Moderate Panoramic view of the San Francisco waterfront area, backdropped by the Bay and East Bay Hills.	High View is representative of the direct, unobstructed foreground view available to nearby residents.	High	Foreground	Low	Extended	Moderate	Moderate to High	Additional structures with prominent vertical forms and lines. Industrial character of the proposed project would be similar to that already established in the landscape. Noticeable increase in visible light at night.	Moderate	Co-Dominant	Low to Moderate	Moderately Adverse	Adverse but Not Significant	VIS-1 VIS-2 VIS-3 VIS-6	Adverse but Not Significant
KOP 2 POTRERO HILL 20TH AND MISSISSIPPI NEIGHBORHOOD	View to the southeast from near the intersection of 20 th Street and Mississippi Street.	Moderate Vista View of the I-280/Third Street Neighborhood backdropped by the Bay and East Bay Hills.	Moderate to High Residents, pedestrians, and motorists anticipate a mixed-use urban landscape that includes existing similar industrial facilities.	Moderate to High	Foreground	Low to Moderate	Brief to Extended	Moderate	Moderate	Additional structures with prominent vertical forms and lines. Industrial character of the proposed project would be similar to that already established in the landscape. Noticeable increase in visible light at night.	Moderate	Co-Dominant	Low	Moderately Adverse	Adverse but Not Significant	VIS-1 VIS-2 VIS-3 VIS-6	Adverse but Not Significant
KOP 3 I-280/ THIRD STREET NEIGHBORHOOD	View to the northeast from near the intersection of 25 th Street and Indiana Street.	Low to Moderate Elevated view of an urban landscape consisting of commercial and industrial visual elements.	Low to Moderate Residents, pedestrians, and motorists anticipate an urban landscape dominated by commercial and industrial visual character.	Moderate to High	Foreground	Low	Extended	Moderate	Low to Moderate	Additional structures with prominent vertical forms and lines. Industrial character of the proposed project would be similar to that already established in the landscape. Noticeable increase in visible light at night.	Moderate	Co-Dominant	Low to Moderate	Moderately Adverse	Adverse but Not Significant	VIS-1 VIS-2 VIS-3 VIS-6	Adverse but Not Significant
KOP 4 HUNTERS POINT NEIGHBORHOOD	View to the north from near the intersection of Hudson Avenue and Ardash Court.	Moderate Panoramic view of San Francisco's eastern industrial waterfront area, backdropped by downtown highrises and the Bay.	Moderate Residents anticipate unobstructed views of the eastern waterfront, downtown highrises, and San Francisco Bay.	Moderate	Middleground	Moderate to High	Brief to Extended	Moderate	Moderate	Additional structures with vertical forms and lines would be minimally noticeable adjacent to the existing power plant.	Low	Subordinate	Low	Slightly Adverse	Adverse but Not Significant		Adverse but Not Significant
KOP 5 BERNAL HEIGHTS NEIGHBORHOOD	View to the northeast from the pedestrian pathway near Brewster.	Moderate Panoramic view of San Francisco's eastern industrial waterfront area, backdropped by the Bay and East Bay Hills.	Moderate Residents anticipate unobstructed views of the eastern waterfront, San Francisco Bay, and East Bay Hills.	Low to Moderate	Middleground	Moderate	Brief to Extended	Low to Moderate	Low to Moderate	Visible new structures of similar industrial character, would be noticeable though not prominent in the middleground distance due to partial screening by intervening structures and terrain.	Low to Moderate	Subordinate	Low	Slightly Adverse	Adverse but Not Significant		Adverse but Not Significant
KOP 6 BAYVIEW NEIGHBORHOOD	View to the northeast from the Silver Avenue / Thomas Avenue neighborhood.	Low to Moderate Panoramic view of San Francisco's eastern industrial waterfront area, backdropped by the Bay and East Bay Hills.	Moderate Residents and pedestrians anticipate unobstructed views of the eastern waterfront, San Francisco Bay, and East Bay Hills.	Moderate	Middleground	Low to Moderate	Brief to Extended	Low to Moderate	Low to Moderate	Visible new structures of similar structural form and industrial character, but smaller in scale compared to the existing Unit 3 stack.	Low to Moderate	Subordinate to Co-Dominant	Low	Moderately Adverse	Adverse but Not Significant		Adverse but Not Significant
KOP 7 Pacific Bell Park	View to the south from Section 328/330	Moderate Panoramic view of San Francisco's eastern industrial waterfront area and San Francisco Bay.	Low to Moderate Though visitors focus on the field within the park, they also anticipate panoramic views of the waterfront, San Francisco Bay, and hills to the south.	Moderate	Middleground	Low to Moderate	Extended	Low to Moderate	Low to Moderate	Visible new structures of similar structural form and industrial character, but smaller in scale compared to the existing Unit 3 stack.	Low	Subordinate	Low	Slightly Adverse	Adverse but Not Significant		Adverse but Not Significant
KOP 8 Aqua Vista Park	View to the south from Aqua Vista Park at Central Basin, due north of the project site.	Low to Moderate View of maritime industrial area along the southern portion of Central Basin.	Low to Moderate Visitors focus on the immediate Bay landscape of Central Basin with views drawn primarily to the east. Viewers anticipate industrial landscape components.	Low to Moderate	Foreground	Low	Extended	Low to Moderate	Low to Moderate	Proposed structures would be slightly noticeable behind the warehouses located along the south side of Central Basin.	Low	Subordinate to Co-Dominant	Low	Slightly Adverse	Adverse but Not Significant		Adverse but Not Significant
KOP 9 San Francisco Bay	View to the west from San Francisco Bay, approximately 1/2-mile northeast of the plant site.	Low to Moderate Panoramic view of San Francisco's eastern industrial waterfront area and San Francisco Bay.	Moderate Boaters focus on the Bay and waterfront shoreline.	Moderate to High	Foreground	Low to Moderate	Extended	Moderate	Moderate	Proposed structures would be clearly visible as foreground structures with industrial character.	Moderate	Co-Dominant	Low	Moderately Adverse	Adverse but Not Significant		Adverse but Not Significant

VISUAL RESOURCES APPENDIX B

Visual Resources Figures 1 through 17B

VISUAL RESOURCES Figure 1
(8 1/2 x 11)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
1	SECAL 2001a Amend. Figure 2-10C	Keep the Same Title. OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 2

(8 1/2 x 11)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
2	SECAL 2000a AFC Figure 8.11-3	Keep the Same Title. OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 3
(11 x 17)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
3	SECAL 2000a AFC Figure 7-2	Keep the Same Title. OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 4
(11 x 17)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
4	DR #48 Revised Figure 8.11-1	New Title: <i>Viewshed and Distance Zones – Existing Exhaust Stack</i> . OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 5
(11 x 17)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
5	DR #48 Revised Figure 8.11-2	New Title: <i>Viewshed and Distance Zones –Proposed Exhaust Stack</i> . OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 6
(Oversize)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title and Additional Graphic Production Guidance</i>
6	SEP2000Dres1 DR #59 Figure 59-1	<p>This is the oversize graphic. New Title: <i>Location of View Areas and Key Observation Points</i>. Renummer the KOPs (black circle with white #) as follows: KOP 1 – delete; KOP 1B – becomes #1; KOP 2 – stays the same; KOP 3 – stays the same; KOP 4 – deleted; KOP 4B – becomes #4; KOP 5 – stays the same; KOP 6 – stays the same; KOP 7 – becomes - #9; KOP 8 – becomes #7; KOP 8 – is new and is added at Aqua Vista Park. OTHER CHANGES AS YOU DEEM APPROPRIATE.</p>

VISUAL RESOURCES Figure 7A
(11 x 17)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
7A	SEP2000Dres1 DR #49 Figure 49-1	Change KOP #1B to KOP #1. Keep remaining title. OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 7B
(11 x 17)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
7B	MIRANT 2001g AFC Amend. Replacement Figure 8.11-6A	Change KOP #1B to KOP #1. Keep remaining title. OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 8A
(11 x 17)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title and Additional Graphic Production Guidance</i>
8A	SECAL 2000a AFC Figure 8.11-7	Keep title as is. Add the following note below image: <i>Not at life-size scale.</i> OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 8B
(11 x 17)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
8B	MIRANT 2001g AFC Amend. Replacement Figure 8.11-8	Keep title as is. OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 9A
(11 x 17)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
9A	SECAL 2000a AFC Figure 8.11-9	Keep title as is. Add the following note below image: <i>Not at life-size scale.</i> OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 9B
(11 x 17)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
9B	MIRANT 2001g AFC Amend. Replacement Figure 8.11-10	Keep title as is. OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 10A
(11 x 17)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
10A	SEP2000Dres1 DR #50 Figure 50-1	Change KOP #4B to KOP #4. Keep remaining title. OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 10B
(11 x 17)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
10B	MIRANT 2001g AFC Amend. Replacement Figure 8.11-12	Change KOP #4B to KOP #4. Keep remaining title. OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 11A
(11 x 17)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
11A	SECAL 2000a AFC Figure 8.11-13	Keep title as is. Add the following note below image: <i>Not at life-size scale.</i> OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 11B
(11 x 17)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
11B	MIRANT 2001g AFC Amend. Replacement Figure 8.11-14	Keep title as is. OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 12A
(11 x 17)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title and Additional Graphic Production Guidance</i>
12A	SECAL 2000a AFC Figure 8.11-15	Change title to the following: <i>KOP #6, Bayview Neighborhood in the Vicinity of Silver Avenue/Thomas Avenue, Existing Condition</i> . Add the following note below image: <i>Not at life-size scale</i> . OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 12B
(11 x 17)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title and Additional Graphic Production Guidance</i>
12B	MIRANT 2001g AFC Amend. Replacement Figure 8.11-16	Change title to the following: <i>KOP #6, Bayview Neighborhood in the Vicinity of Silver Avenue/Thomas Avenue, Simulation Showing Proposed Project.</i> OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 13A
(Oversize Foldout)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
13A	SEP2000Dres1 DR #55 Figure 55-3	Change KOP #8 to KOP #7. Keep remaining title. OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 13B
(Oversize Foldout)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
13B	MIRANT 2001g AFC Amend. Replacement Figure 8.11-18	Change KOP #8 to KOP #7. Keep remaining title. OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 14A
(Oversize Foldout)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
14A	SEP2001Dresp4 DR #180 Figure 180-1	Add <i>KOP #8</i> to beginning of title. Keep remaining title. OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 14B
(Oversize Foldout)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
14B	MIRANT 2001g AFC Amendment Figure 8.11-19	Change KOP #9 to KOP #8. Keep remaining title. OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 15A
(11 x 17)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
15A	SEP2000Dres1 DR #55 Figure 55-1	Change KOP #7 to KOP #9. Keep remaining title. OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 15B
(11 x 17)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
15B	MIRANT 2001g AFC Amendment Figure 8.11-17	Change KOP #7 to KOP #9. Keep remaining title. OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 16
(Oversize Foldout)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title and Additional Graphic Production Guidance</i>
16	SEP2000Dres1 DR #55 Figure 55-5	Change title to the following: <i>South of Market Highrise View</i> . OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 17A
(11 x 17)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
17A	SEP2000Dres1 DR #49 Figure 49-3	Change KOP #1B to KOP #1. Keep remaining title as is. OTHER CHANGES AS YOU DEEM APPROPRIATE.

VISUAL RESOURCES Figure 17B
(11 x 17)

Visual Resources Figure #s	Applicant Source Figure #s	<i>Title</i> and Additional Graphic Production Guidance
17B	MIRANT 2001g AFC Amend. Replacement Figure 8.11-6B	Change KOP #1B to KOP #1. Keep remaining title. OTHER CHANGES AS YOU DEEM APPROPRIATE.

WASTE MANAGEMENT

Michael Ringer

INTRODUCTION

This analysis presents an assessment of issues associated with managing wastes generated from constructing and operating the Potrero Power Plant Unit 7 Project (Unit 7). It evaluates the proposed waste management plans and mitigation measures designed to reduce the risks and environmental impacts associated with handling, storing, and disposing of project-related hazardous and nonhazardous wastes. The technical scope of this analysis encompasses wastes generated during facility construction and operation, except wastewaters discharged to municipal treatment facilities or navigable waters. These are discussed in the **Soil and Water Resources** section of this document.

Energy Commission staff's objectives in its waste management analysis are to ensure that:

The management of wastes will be in compliance with all applicable laws, ordinances, regulations, and standards (LORS). Compliance with LORS ensures that wastes generated during constructing and operating the proposed project will be managed in an environmentally safe manner; and
Disposal of project wastes will not result in significant adverse impacts to existing waste disposal facilities.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

RESOURCE CONSERVATION AND RECOVERY ACT (42 U.S.C. § 6922)

RCRA establishes requirements for the management of hazardous wastes from the time of generation to the point of ultimate treatment or disposal. Section 6922 requires generators of hazardous waste to comply with requirements regarding:

- Record keeping practices which identify quantities of hazardous wastes generated and their disposition,
- Labeling practices and use of appropriate containers,
- Use of a manifest system for transportation, and
- Submission of periodic reports to the U.S. Environmental Protection Agency (USEPA) or authorized state.

TITLE 40, CODE OF FEDERAL REGULATIONS, PART 260

These sections contain regulations promulgated by the USEPA to implement the requirements of RCRA as described above. Characteristics of hazardous waste are

described in terms of ignitability, corrosivity, reactivity, and toxicity, and specific types of wastes are listed.

STATE

CALIFORNIA HEALTH AND SAFETY CODE §25100 ET SEQ. (HAZARDOUS WASTE CONTROL ACT OF 1972, AS AMENDED).

This act creates the framework under which hazardous wastes must be managed in California. It mandates the State Department of Health Services (now the Department of Toxic Substances Control under the California Environmental Protection Agency, or Cal EPA) to develop and publish a list of hazardous and extremely hazardous wastes, and to develop and adopt criteria and guidelines for the identification of such wastes. It also requires hazardous waste generators to file notification statements with Cal EPA and creates a manifest system to be used when transporting such wastes.

TITLE 14, CALIFORNIA CODE OF REGULATIONS, §17200 ET SEQ. (MINIMUM STANDARDS FOR SOLID WASTE HANDLING AND DISPOSAL)

These regulations set forth minimum standards for solid waste handling and disposal, guidelines to ensure conformance of solid waste facilities with county solid waste management plans, as well as enforcement and administration provisions.

TITLE 22, CALIFORNIA CODE OF REGULATIONS, §66262.10 ET SEQ. (GENERATOR STANDARDS)

These sections establish requirements for generators of hazardous waste. Under these sections, waste generators must determine if their wastes are hazardous according to either specified characteristics or lists of wastes. As in the federal program, hazardous waste generators must obtain identification numbers, prepare manifests before transporting the waste off site, and use only permitted treatment, storage, and disposal facilities. Additionally, hazardous waste must only be handled by registered hazardous waste transporters. Generator requirements for record keeping, reporting, packaging, and labeling are also established.

LOCAL

SAN FRANCISCO HEALTH CODE ARTICLE 22A

This article, known as the Maher ordinance, requires that, whenever more than 50 cubic yards of soil would be disturbed Bayward of the high tide line, an applicant for a building permit must provide a site history, sampling for hazardous waste, and a site mitigation report, if applicable.

SETTING

PROJECT AND SITE DESCRIPTION

The Unit 7 project consists of a nominal 540-megawatt natural gas-fired combined cycle power plant proposed to be located within the boundaries of the existing Potrero Power Plant south of the San Francisco central business district. The project is proposed to be constructed on about 6.5 acres in the south-central portion of the existing 20 acre site. Natural gas would be supplied via an existing gas supply pipeline. The project would also include construction of a new 115-kV switchyard located at the west end of the property between the existing Pacific Gas and Electric (PG&E) substation and proposed Unit 7. A direct interconnection would be made to PG&E's Potrero Substation while a separate underground connection would be made to PG&E's Hunters Point Substation located about 1.8 miles to the south of the Potrero Power Plant.

Mirant is currently in negotiations with Hetch Hetchy Water and Power (HHWP) to form a joint venture for the electric transmission line corridor. HHWP plans to construct and own the utility duct bank and Mirant will be a tenant (Mirant2001DResCCSF, Data Response No. 2).

As part of developing the circulating cooling water supply for the proposed project, the cooling water intake for Potrero Unit 3, an existing unit, would be replaced and combined with a new intake for Unit 7. The new intake structure would be located south of the existing Unit 3 discharge. Two new cooling water discharge systems, with diffusers, would be constructed to serve both the new unit 7 and existing unit 3.

EXISTING STRUCTURES

The portion of the Potrero Power Plant site proposed for construction is occupied by a group of abandoned structures known as the Station A complex, which was built about 1910, decommissioned in 1979, and partially demolished in 1981. Remaining structures include the turbine hall portion of the main powerhouse, gate house, meter building, compressor building, and pump house. These structures are seismically unstable and, since Mirant has no plans for their future use, are scheduled for demolition and removal during the first three months of the Unit 7 project. In addition, a prefabricated metal shop building located west of the meter house and compressor building will be dismantled and relocated offsite.

SITE CHARACTERIZATION (ON-SHORE)

The site has a history of industrial activity dating from at least 1870, including operation of manufactured gas plants, barrel manufacturing, sugar refining, and power generation. PG&E became the owner of the property in 1911. Southern Energy of California (now Mirant Corporation) recently purchased the Potrero site from PG&E, but under contractual terms, PG&E retains responsibility for cleaning up onsite contamination created prior to the sale.

As the previous owner of the site, PG&E has sponsored several site investigations to determine the nature and extent of any soil or groundwater contamination. These

include a Preliminary Endangerment Assessment, Phase I and II Environmental Site Assessments (ESAs), and a Report of Results of Additional Site Characterization.

PHASE I ESA

The Phase I ESA was done in October, 1997 in accordance with American Society for Testing and Materials Standard E 1527-94, Standard Practice for Environmental Site Assessments (SECAL 2000a, AFC Appendix M). The purpose of an ESA is to determine the potential for the presence or likely presence of any hazardous substances or petroleum products under conditions that may indicate a release or threat of a release from present or past activities. No soil or groundwater samples were collected during the Phase I ESA.

The activities that were conducted as part of the Phase I ESA consisted of the following:

- A records review of the site and adjoining and surrounding properties, including PG&E permits, programs, plans, and internal correspondence; federal, state, regional, and local regulatory agency databases; and regulatory agency files for the plant and sites requiring further investigation;
- A site walkthrough that included visual observations of the site and its facilities and improvements; and visual observations of adjoining properties, including an assessment of the use, storage, and disposal of hazardous materials and hazardous wastes; and
- Interviews with people familiar with the site and past and present operations, including plant staff and regulatory officials from Region IX of the U.S. EPA, DTSC, the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB), and the City and County of San Francisco Department of Public Health (SFDPH).

The Phase I ESA identified several issues of environmental concern, both sitewide and site-specific. Sitewide issues included contamination of soils and groundwater by various organic constituents and heavy metals, tank and drum storage on unpaved areas, unknown constituents in the artificial fill in the eastern part of the site, and a possible 1988 asbestos release. Site-specific issues included possible hydrocarbon spills associated with underground and aboveground storage tanks and/or piping, excavated soils, and contents of former plant buildings.

PHASE II ESA

A Phase II ESA was conducted in June, 1998, prior to the sale of the property (Fluor Daniel 1998). It included the collection of subsurface soil and groundwater data in response to issues identified in the Phase I ESA.

The following summarizes the analytical results for the Phase II soil sampling data:

- Total petroleum hydrocarbons (TPH) were found in near-surface and subsurface soils and in the upper saturated zone. Sixteen areas across the site had concentrations greater than 1,000 mg/kg, with six of these located within the

area of planned excavation. The highest concentration was found in the northeast corner of the site, outside of the construction area.

- Total polynuclear aromatic hydrocarbons (PAHs) exceeding 100 mg/kg were found in near- and subsurface soils to depths to 40 feet. With two exceptions, the maximum concentrations for individual PAHs were located at depths of at least 24 feet. Only five samples with individual PAH concentrations exceeding 100 mg/kg were located at depths less than 13 feet. Within the proposed excavation footprint, two PAHs with concentrations as high as 250 mg/kg at three feet and 47 mg/kg at nine feet were found.
- Three metals were found at levels exceeding regulatory limits for hazardous waste: copper in one boring, lead in three borings, and nickel in one boring. Within the proposed excavation footprint, nickel and lead were found in excess of regulatory limits, and chromium at slightly more than one-half the limit was found.
- Volatile organic compounds (VOCs) were detected mostly in samples from the northeastern portion of the site at depths greater than 20 feet. Within the proposed excavation footprint, benzene was found at a depth of nine feet, while toluene, ethylbenzene and total xylenes were found in a surface sample.
- Cyanide was detected at various depths and locations across the site, with the southwest portion of the site appearing to be the most impacted area.
- Polychlorinated biphenyls were detected in 10 of 99 samples analyzed. All detections were from samples from the eastern portion of the property.
- Three phenolic compounds were detected in soil, however, none were found in samples collected from the proposed excavation footprint.
- Naturally occurring asbestos from serpentine bedrock was found at concentrations greater than one percent (the regulatory level defining hazardous waste) in samples from 15 locations at depths of less than 13 feet. Two surface samples from the excavation footprint contained asbestos at two percent, and one sample contained three percent.

The following summarizes the analytical results for the Phase II groundwater sampling data (a discussion of groundwater data may be found in the Soil and Water Resources section of the staff assessment):

- Total petroleum hydrocarbons were found in groundwater at relatively low concentrations throughout the entire site. However, concentrations exceeding 10 mg/L were found in wells in the northeastern and southeastern portions of the site.
- A total of 16 PAHs were detected across the site. The highest concentrations of eight of these were found in a well along the eastern edge of the site, while three others were from a well associated with the northeastern dense non-aqueous phase liquid (DNAPL) pool. These results may not be indicative of dissolved phase concentrations, but may reflect small amounts of entrained separate phase material in the groundwater sample.
- Metals were detected at low concentrations in samples collected from across the site. Barium, chromium, lead, mercury, and selenium were detected at concentrations exceeding regulatory thresholds for hazardous waste classification in at least one well.

- Volatile organic compounds were present in groundwater in areas related to the impacted soil.
- The highest concentration of total cyanide in groundwater was found in the sample collected from the western edge of the property.
- No polychlorinated biphenyls were detected at a level greater than the method detection limit.

Chemicals were also detected in non-aqueous layers, including light- and dense non-aqueous phase liquids (LNAPL and DNAPL, respectively). LNAPL, which was found floating above groundwater in one of the monitoring wells in the northeast portion of the site, contained TPH at a concentration of 675,000 mg/kg and relatively low concentrations of PAHs. DNAPL at the bottom of two monitoring wells in the eastern and northeastern portion of the site was measured at 6.3 and 7.5 feet in thickness. The samples contained 520,000 and 5,810 mg/kg of TPH, respectively. PAH concentrations found in the sample from the monitoring well in the eastern portion of the site were 54,000 mg/kg for acenaphthene and 51,000 mg/kg for naphthalene.

ADDITIONAL SITE ASSESSMENT

Following the Phase II ESA, an additional site assessment was performed to address data gaps from the previous investigations (Geomatrix 2000). The additional investigation obtained information regarding:

- the extent and magnitude of cyanide in groundwater across the site,
- the extent and magnitude of TPH and PAHs in the southwestern area of the site (the area of the proposed Unit 7), and
- the extent and characteristics of DNAPL in the northeastern and eastern areas of the site.

Field activities conducted as part of the additional site assessment included installation of groundwater monitoring wells, collection of groundwater samples, collection of DNAPL samples for chemical analyses, and measurement of DNAPL and LNAPL depth and thickness.

The following summarizes the distribution of chemicals in groundwater:

- Concentrations of cyanide in the southwestern area were low to non-detect. Cyanide was not detected in samples from existing wells located within the proposed excavation areas.
- Concentrations of TPH in samples collected from wells within the southwestern area of the site were less than one mg/l, with the exception of one sample that contained 3.7 mg/l of TPH quantified as crude oil. A sample from a well located in the southern portion of the proposed excavation of unit 7 was not analyzed due to the presence of an LNAPL sheen. Samples collected from the easternmost shoreline wells in the vicinity of the excavation footprint ranged from non-detect to 1.1 mg/L. Concentrations of TPH in groundwater samples collected from wells in the northeastern corner of the site, outside of the excavation footprint, were as high as 6.5 mg/L.

- Benzene was not detected in three of four wells sampled within the vicinity of the excavation footprint, but was detected at concentrations as high as 3.9 mg/L in wells significantly outside of the excavation footprint.
- Concentrations of PAHs in the southwest area of the site ranged from non-detect to less than 0.050 mg/L. Naphthalene was detected at concentrations of less than or equal to 0.11 mg/L in wells located within the vicinity of the excavation footprint and as high as 8.4 mg/L in wells significantly outside the excavation footprint in the northeastern area.

The following summarizes the distribution of chemicals in non-aqueous layers:

- LNAPLs were detected in two monitoring wells in the northeastern portion of the site (outside of the excavation footprint) at thicknesses of 0.85 foot and 0.1 foot, respectively.
- Thickness of DNAPL in the northeastern area ranged from approximately three to six feet, at depths of about 20 feet below ground surface (bgs). In the eastern area of the site, in the vicinity of the excavation footprint, DNAPL thickness ranged from about 3 to 14 feet, at a depth of about 35 feet bgs. Samples of DNAPL from the northeastern and eastern areas contained TPH at concentrations as high as 51 and 100 percent. Benzene concentrations ranged from 0.2 to 0.51 percent. Naphthalene was detected at concentrations ranging from 5.5 to 5.8 percent. Leachability analyses indicated that the DNAPL has the potential to leach dissolved constituents.

SFDPH reviewed existing data for compliance with the Maher Ordinance requirements, and determined that additional information is necessary. In response, Mirant developed a workplan to supplement the existing Site Mitigation and Implementation Plan, or SMIP (Mirant2001DResCCSF, Data Response No. 6). The workplan includes tasks designed to further characterize excavation materials for the possible reuse or offsite disposal and includes a soil sampling and analysis plan and the collection of supplemental soil analytical data. Mirant will perform the following tasks prior to the handling, reuse, and disposal of material:

- Task 1 – Prepare a soil sampling and analysis plan as required under the Maher Ordinance for review and approval by the SFDPH.
- Task 2 – Collect and analyze soil samples from the conduit, power block, and cooling water intake structure excavation areas.
- Task 3 – Prepare a soils analysis report summarizing the results of the sampling data.

Mirant is continuing to work with SFDPH to provide the information necessary to comply with Maher ordinance requirements. The final SMIP must be approved by the SFDPH as required by staff's proposed Condition of Certification WASTE-6.

OFF-SHORE (SEDIMENT) CHARACTERIZATION

Mirant conducted sediment sampling at 12 offshore locations in July 2000 (SECAL2000Seds1). The purpose was to obtain initial sediment quality data in areas where dredging may be needed during construction of the proposed cooling

water intake and discharge structures. The sampling locations were located 50 to 250 feet offshore along five shore-perpendicular transects. Sediment cores up to 12 feet in length were collected and subsampled at approximately three-foot intervals. The samples were analyzed for a variety of parameters, including total solids, total organic carbon, metals, TPH, PAHs, pesticides, and PCBs. Some samples were tested for cyanide, VOCs, and semivolatile organic compounds.

Sampling results showed that high PAH concentrations were detected at three nearshore locations, with PAH concentrations generally increasing with depth. Lower levels of PAHs, VOCs and other compounds were detected at other locations. Metal and PCB/pesticide concentrations were found to be on the same order as background concentrations. Sediment layers containing oily black fluids were observed in the nearshore cores.

A second sediment sampling effort took place during the week of January 15, 2001, to finalize the location of the intake structure and diffuser pipes. A total of 19 additional locations were included, with 13 of the locations focusing on PAH analysis, and six locations to include the complete analyses referred to above. Results and analysis of this latest sampling have not yet been received by staff.

IMPACTS

PROJECT SPECIFIC IMPACTS

SITE PREPARATION

Hazardous and nonhazardous wastes will be generated by the demolition of buildings during site preparation as well as the excavation of contaminated on-shore soils and off-shore sediments.

BUILDING DEMOLITION

Site preparation will include the removal of the structures described in the **Project and Site Description** discussion above. Prior to demolition, the buildings will undergo a Hazardous Materials Abatement by a licensed contractor (SECAL 2001a, AFC Amendment p. 2-26). Confirmation of the removal of hazardous materials will be made via a walk-through inspection prior to demolition. Hazardous wastes expected to be generated from the abatement process include 1,120 cubic yards of asbestos, 30 drums of lead, 10 drums of polychlorinated biphenyl ballasts, 40,000 linear feet of fluorescent lights, and 550 gallons of miscellaneous wastes (SEP 2000a, response to staff data request 140, Table 140-1). These wastes will be transported to hazardous materials disposal sites listed in Application for Certification Station A Amendment Table 141-1 (SEP 2000a, response to staff data request 141).

Nonhazardous wastes generated from the demolition of station A structures include an estimated 6,000-8,000 yd³ of concrete debris, 8,000-10,000 yd³ of brick debris, and 400-500 tons of scrap metal (SECAL 2001a, AFC Amendment table 2.8, p. 2-

51). All metals would be transported to a recycling facility in Oakland (SECAL 2001a, AFC Amendment p. 2-26). The brick debris would either be crushed onsite for recycling as fill material, or transported to a recycling plant in Half Moon Bay (Id.). Concrete may be crushed and recycled onsite depending on the need for fill material and the composition of the concrete. Remaining concrete debris would be transported to a concrete recycling plant located near the Hunters Point Power Plant (Id.).

ON-SHORE SOIL CONTAMINATION

As noted above, PG&E is responsible for remediating contamination created prior to Mirant's purchase of the property. PG&E has requested the Site Designation Committee within the California Environmental Protection Agency to designate the San Francisco Regional Water Quality Control Board (SFRWQCB) as the lead agency in overseeing site cleanup. The purpose of the Site Designation process is to allow a Responsible Party who agrees to carry out a site investigation and remedial action to request the designation of a single state or local agency to oversee the site investigation and remedial action. On March 29, the Committee approved PG&E's request and designated the SFRWQCB the lead agency for the site.

PG&E plans to coordinate its final Remedial Action Plan with the Site Mitigation and Implementation Plan (SMIP) prepared by Mirant (SECAL 2000a, AFC Appendix D1).

Excess soil that is generated or not suitable for reuse based on its geotechnical qualities will be profiled for offsite disposal. The actual volume of soil that will be reused or disposed is unknown until testing is accomplished, but initial estimates are presented in Table 13 of the SMIP (SECAL 2000a, AFC Appendix D2). The total volume of material to be excavated is estimated to be about 37,000 cubic yards, excluding amounts for the intake structure.

Soil chemical data from the site investigations were examined and used to develop likely management and disposal requirements. Analytical results for soil borings within the footprint of the proposed excavations were compared to the following criteria: (1) Ten times the Soluble Threshold Limit Concentrations for metals in Title 22 of the California Code of Regulations, (2) U.S. EPA Region IX 1999 Preliminary Remediation Goals (PRGs) for PAHs in industrial soils, and (3) 1,000 mg/kg concentration for TPH.

Concentrations of nickel, chromium, and lead were found in excess of regulatory levels at all depths throughout the excavation footprints. These three metals will drive the classification of excavated material for the purposes of disposal. Multiple PAHs at concentrations above the Region IX PRG limits for industrial soils were found. Most landfills will accept soils containing PAHs and petroleum hydrocarbons at the concentrations found. Only one surface soil sample located within the 23rd street conduit excavation footprint contained PCBs above the industrial PRG. There were no soils containing phenolics in any of the samples from the excavation footprint area. No VOCs at concentrations in excess of the industrial soils PRG

were found in soil samples within the area to be excavated. Naturally occurring asbestos containing materials were found in three surface samples where the concentration exceeded one percent.

Excavated material will be stockpiled on site, sampled, and analyzed to determine future reuse or offsite disposal options. The proposed stockpile area will be within the construction laydown area. The stockpile areas will be bermed and lined to reduce the potential for migration of contaminated material. The stockpile area will be covered with a plastic liner which will extend to a berm which will be created around the perimeter with either clean soil or hay bales. The surface of the stockpile will be sprayed with water to minimize the potential for fugitive dust emissions. If required for odor or dust control, the stockpile will remain covered and only the working face will be exposed when material needs to be added or removed. At the end of each day, the stockpile will be covered with plastic sheeting held in place with sandbags (Mirant2001DResCCSF, Data Response No. 8).

OFF-SHORE ACTIVITIES

Nearshore dredging will be required for construction of cooling water intake and discharge structures. Construction of the intake structure will generate almost 10,000 cubic yards of sediment (Mirant2001DResCBE, Data Response No. 15). About 34,000 cubic yards of material will be dredged during construction of the discharge pipes. As noted above, staff is awaiting additional information from sampling activities conducted in January to characterize the sediments near the diffusers.

CONSTRUCTION

Nonhazardous and hazardous wastes will also be generated during construction of the proposed facility.

A variety of nonhazardous waste streams will be generated from construction of the generating plant and ancillary equipment. Paper, wood, glass, and plastics will be generated from packing materials, waste lumber, insulation, and empty chemical containers. The applicant estimates that about 150 tons of these wastes will be generated (SECAL 2000a, AFC p. 8.13-2), and those which cannot be recycled will be disposed of in a Class III landfill. The applicant also expects that about 100 tons of excess concrete will be generated during the course of construction (SECAL 2000a, AFC p. 8.13-3). The applicant proposes to use as much of the waste concrete as possible to fill protective pipe bollards, to precast small slab or retaining wall section, or to place nonstructural features such as sidewalks, steps, etc. The remaining scrap concrete will be buried onsite, if permitted, or disposed of in a Class III landfill (Id.). In addition, metal wastes will be generated from welding/cutting operations, packing materials, empty chemical containers, and wiring. About 50 tons of metal wastes are expected, and that which cannot be recycled will be deposited in a Class III landfill (Id.).

Hazardous wastes that may be generated during facility construction include waste oil and grease, paint, spent solvents, welding materials, and cleanup materials from spills of hazardous substances. AFC Table 8.13-3 presents the types and

quantities of hazardous wastes that are anticipated to be generated during construction. The quantities of solid hazardous wastes are expected to be relatively minor, as is typical for this type of project. Most of the liquid hazardous wastes would be recycled.

The construction contractor is considered the actual waste generator and will be responsible for proper hazardous waste handling. Such wastes will be collected in hazardous waste accumulation containers near the point of generation. The containers will be taken to the construction contractor's hazardous waste storage area and within 90 days will be delivered to an authorized hazardous waste management facility (SECAL 2000a, AFC p. 8.13-4).

Part of the proposed Unit 7 project consists of an interconnection to PG&E's Hunters Point Substation via two 115-kV underground transmission cables that must be constructed. The cables will be buried in a trench that follows secondary city streets within existing street rights-of-way and also within an abandoned railroad right-of-way. The total length of the route is approximately 9,400 feet. The route is proposed to cross Islais Creek Channel south of the Potrero PP and east of the Third Street bridge.

AFC Table 2-18 presents estimated amounts of transmission line construction debris for each segment of the trench. As excavation proceeds, clean soil will be stockpiled adjacent to the trench. Street surfacing will be removed and disposed of. Directional boring would be used for cable installation under Islais Creek. To facilitate the boring (i.e., power the cutting head, stabilize the hole against collapse, and provide a transport medium for cuttings), bentonite clay would be used. This is a naturally occurring clay with hydrophilic properties. At the completion of the bore, the bentonite slurry would be dewatered and recycled for use in other projects.

OPERATION

Under normal operating conditions, the proposed facility will generate both nonhazardous and hazardous wastes.

Nonhazardous wastes generated during plant operation include solid wastes such as trash, office wastes, empty containers, broken or used parts, used packing material, and used filters. Mirant has estimated annual quantities and proposed management methods for nonhazardous wastes generated from routine operation of Unit 7 (SEP 2000a, Table 142-1, response to staff data request 142).

Demineralized water is presently supplied to the Potrero Power Plant from a mobile trailer-mounted water treatment system, which is supplied by a vendor. Regeneration of the catalyst beds and other maintenance cycles are performed offsite by the vendor, who is responsible for the disposal of all waste streams that result from operation of the units (SECAL 2000a, AFC p. 2-9).

Hazardous wastes likely to be generated during routine project operation include spent air pollution control catalysts, used oil and filters, used cleaning solvents, waste paint, sandblast media, compressor washwater, and contaminated cleanup

materials. The types and quantities of hazardous wastes expected to be generated, along with their management methods, are shown in AFC Table 8.13-3. About 90 tons of solid hazardous waste would be generated annually, with between 70 and 95 percent expected to be recycled (SECAL 2000a, AFC p. 8.13-5). The maximum volumes of hazardous wastes that are estimated to be accumulated onsite is listed in Table 126-1 of the Responses to SAEJ data requests (Mirant2001DResSAEJ, Data Response No. 126).

There is an existing hazardous waste storage building located on the northeast corner of the plant property near the Unit 3 intake and storm drain 4. The building typically contains sealed containers with wastes segregated by type. The building and hazardous waste storage areas are inspected weekly.

IMPACT ON EXISTING WASTE DISPOSAL FACILITIES

Nonhazardous waste which is not recycled will be disposed of at one of the regional Class III landfills in the area. AFC Table 8.13-1 lists landfills and recycling facilities in the vicinity of the Unit 7 project. Each of the facilities listed have large operating and permitted capacities relative to the quantities of waste expected from project operation. Even discounting the effects of recycling on the total amount of non-hazardous wastes destined for landfilling, the amount of waste generated during project construction and operation are insignificant relative to existing disposal capacity.

Three Class I landfills in California, at Kettleman Hills in King's County, Buttonwillow in Kern County, and Westmoreland in Imperial County, are permitted to accept hazardous waste. There is a combined total in excess of twenty million cubic yards of remaining hazardous waste disposal capacity at these facilities with remaining lifetimes as long as 50 years. Also, the amount of hazardous waste being transported to these landfills has decreased in recent years due to source reduction efforts by generators, and the transport of waste out of state that is hazardous under California law, but not federal law.

Much of the hazardous waste generated during facility construction and operation will be recycled, such as used oil and spent catalysts. Even without recycling, the generation of hazardous waste from Unit 7 would comprise only a small fraction of existing capacity (less than one percent), and not significantly impact the capacity of any of the state's Class I landfills.

CUMULATIVE IMPACTS

Due to the minor amounts of wastes generated during project construction and operation, the insignificant impacts on individual disposal facilities, and the availability of additional regional landfills, cumulative impacts will be insignificant for both hazardous and nonhazardous wastes.

FACILITY CLOSURE

During any type of facility closure (see staff's **General Conditions** section which discusses planned, unexpected temporary, and unexpected permanent closure), the primary waste management related concern is that project wastes not pose any potentially significant problem to the public, workers, or the environment. Staff has determined that conditions of certification in the **General Conditions** section will adequately address waste management issues related to closure.

In the case of unexpected temporary closure, waste management practices normally required by LORS and already in-place (such as limiting hazardous waste accumulation time to 90 days and requiring proper containment) would likely be adequate to avoid significant problems. In addition, staff's General Conditions for Facility Closure require preparation of an on-site contingency plan which shall provide for removal of hazardous wastes and draining of all chemicals from storage tanks and other equipment for temporary closures exceeding 90 days.

An approved on-site contingency plan is also required to protect public health and safety in the case of unexpected permanent closure. As above, the plan must provide for the removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment.

For planned permanent closure, Mirant is required to develop a facility closure plan at least twelve months prior to commencement of closure and is committed to complying with LORS which are applicable at the time of closure (SECAL 2000a, AFC p. 8.13-11).

COMPLIANCE WITH APPLICABLE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Additional information pertaining to the nature and extent of contaminated sediment that will be disturbed during construction of the offshore diffusers is to be submitted by Mirant. Mirant is also continuing to work with SFDPH to submit additional information required for compliance with the Maher Ordinance. Staff therefore cannot at this time definitively conclude that compliance with all applicable Department of Toxic Substances Control, Regional Water Quality Control Board, and SFDPH requirements will be met during project construction.

Energy Commission staff concludes that the Unit 7 project will be able to comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during project operation. The applicant is required to dispose of hazardous and non-hazardous wastes at facilities approved by the San Francisco Bay Regional Water Quality Control Board or the Cal EPA - Department of Toxic Substances Control. Because hazardous wastes will be produced during project construction and operation, Mirant must acquire and maintain an identification number as a hazardous waste generator. Accordingly, Mirant will be required to properly store, package and label waste, use only approved transporters, prepare

hazardous waste manifests, and keep detailed records. Pursuant to California Code of Regulations, title 22, section 67100.1 et seq., a hazardous waste source reduction and management review may be required, depending on the amounts of hazardous waste ultimately generated.

MITIGATION

Mirant intends to implement the following mitigation measures during construction and operation of the proposed Unit 7 project (AFC p. 8.13-11):

- Employees will be trained in hazardous waste procedures, spill contingencies, and waste minimization.
- Procedures will be developed to reduce the quantity of hazardous wastes generated. Nonhazardous materials will be used instead of hazardous materials whenever possible, and wastes will be recycled whenever possible.

Energy Commission staff has examined the mitigation measures proposed by Mirant and concluded that the measures together with applicable LORS will adequately assure that no significant environmental impacts will result from the management and disposal of project-related waste.

CONCLUSIONS

Staff cannot determine at this time if construction of the offshore diffusers will result in significant impacts until additional information pertaining to the nature and extent of contaminated sediment is analyzed. Also, staff is not be able to conclude that construction of the diffusers will be able to comply with all applicable agency requirements.

Management of the wastes generated during operation of the Unit 7 project will not result in any significant adverse impacts if Mirant implements the mitigation measures proposed in the AFC, the additional measure proposed by staff below, and the proposed conditions of certification.

Staff recommends that, during excavation activities, Mirant have a Registered Professional Engineer or Geologist available to determine the need for sampling when contamination is suspected. The Engineer or Geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner and CPM stating the recommended course of action, prior to any further construction activity at that location. If significant remediation may be required, Mirant will be required to contact representatives of the San Francisco Department of Public Health and the Berkeley Office of the California Department of Toxic Substances Control for consultation and possible oversight of remedial activities.

CONDITIONS OF CERTIFICATION

WASTE-1 The project owner shall obtain a hazardous waste generator identification number from the Department of Toxic Substances Control prior to generating any hazardous waste.

Verification: The project owner shall keep its copy of the identification number on file at the project site and notify the CPM of its receipt via a copy included with the monthly compliance report.

WASTE-2 The project owner shall notify the CPM of any waste management-related enforcement action taken or proposed to be taken against it, or against any waste hauler or disposal facility or treatment operator that the owner contracts with.

Verification: The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action.

WASTE-3 Prior to the start of both construction and operation, the project owner shall prepare and submit to the CPM, for review and comment, a waste management plan for all wastes generated during construction and operation of the facility, respectively. The plans shall contain, at a minimum, the following:

- A description of all waste streams, including projections of frequency, amounts generated and hazard classifications; and
- Methods of managing each waste, including treatment methods and companies contracted with for treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/reduction plans.

Verification: No less than 60 days prior to the start of construction, the project owner shall submit the construction waste management plan to the CPM for review. The operation waste management plan shall be submitted no less than 60 days prior to the start of project operation. The project owner shall submit any required revisions within 30 days of notification by the CPM (or mutually agreed upon date). In the Annual Compliance Reports, the project owner shall document the actual waste management methods used during the year compared to planned management methods.

WASTE-4 The project owner shall have a Registered Professional Engineer or Geologist, with experience in remedial investigation and feasibility studies, available for consultation during soil excavation and grading activities. The Registered Professional Engineer or Geologist shall be given full authority to oversee any earth moving activities that have the potential to disturb contaminated soil.

Verification: At least 30 days prior to the start of construction, the project owner shall submit the qualifications and experience of the Registered Professional Engineer or Geologist to the CPM for approval.

WASTE-5 If potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, or other signs, the Registered Professional Engineer or Geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner and CPM stating the recommended course of action, prior to any further construction activity at that location. If, in the opinion of the Registered Professional Engineer or Geologist, significant remediation may be required, the project owner shall contact representatives of the San Francisco Department of Public Health and the Berkeley Office of the California Department of Toxic Substances Control for guidance and possible oversight.

Verification: The project owner shall submit any reports filed by the Registered Professional Engineer or Geologist to the CPM within 5 days of their receipt.

WASTE-6 The project owner shall prepare a Site Mitigation and Implementation Plan in accordance with the requirements of the Maher Ordinance.

Verification: At least 30 days prior to ground disturbance, the project owner shall submit the Site Mitigation and Implementation Plan, including comments from the San Francisco Department of Public Health, to the CPM for review and approval.

REFERENCES

- Fluor Daniel. 1998. Phase II Environmental Site Assessment, Pacific Gas and Electric Company, Potrero Power Plant. Prepared for John Busterud, Esq., Pacific Gas and Electric Company. June.
- Geomatrix (Geomatrix Consultants). 2000. Report of Results, Additional Site Characterization, Potrero Power Plant Site. Prepared for Pacific Gas and Electric Company. April.
- Mirant (Mirant Corporation). Mirant2001DResCBE. Mirant responses to Communities for a Better Environment, Data Requests, Nos. 1 through 113, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission April 25, 2001.
- Mirant (Mirant Corporation). Mirant2001DResCCSF. Mirant responses to City and county of San Francisco, Data Requests, Set II, Nos. 1 through 11, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission April 10, 2001.
- Mirant (Mirant Corporation). Mirant2001DResSAEJ. Mirant responses to Southeast Alliance for Environmental Justice, Data Requests, Set 1, Nos. 1 through 155, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission February 27, 2001.
- SECAL (Southern Energy California). 2000a. Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, May 31.
- SECAL (Southern Energy California). SECAL2000Seds1. Draft Initial Findings Report, Offshore Sediment Sampling, Potrero Power Plant, September 28, 2000. Submitted to the California Energy Commission, October 20, 2000.
- SECAL (Southern Energy California). 2001a. Amendment to the Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Addresses the demolition of six existing structures. Submitted to the California Energy Commission, January 19, 2001.
- SEP (Southern Energy Potrero LLC). 2000a. Southern Energy Potrero LLC (SEP) response to staff 11/28/2000 Data Requests, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission, December 21.

SOIL & WATER RESOURCES

Testimony of Joe Crea, Dominique Brocard, and Jim Henneforth

INTRODUCTION

This section of staff's Preliminary Staff Assessment (PSA) analyzes potential effects on soil and water resources from the construction and operation of the Potrero Power Plant Unit 7 Project (Unit 7), proposed by Mirant Potrero, LLC (Mirant). The analysis focuses on the potential for the project to induce erosion and sedimentation, and to adversely affect water quality and quantity. This PSA also addresses the project's ability to comply with all applicable federal, state and local laws, ordinances, regulations and standards. Where the potential for impacts is identified, staff proposes mitigation measures to reduce the significance of the impacts and, as appropriate, recommends conditions of certification.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

CLEAN WATER ACT

The Clean Water Act (33 U.S.C. § 1251), formerly the Federal Water Pollution Control Act of 1972, was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States.

The Clean Water Act requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point source discharges to surface water. These discharges are regulated by the National Pollutant Discharge Elimination System (NPDES). In California, NPDES permitting authority is delegated to, and administered by, the nine Regional Water Quality Control Boards. A new NPDES permit will be required from the San Francisco Regional Water Quality Control Board (SFRWQCB) for Unit 7 as a new source under the Clean Water Act. The NPDES permit regulates cooling water, other wastewater and operational stormwater discharges. Stormwater discharges related to earthmoving activities involving five or more acres of earth disturbance also fall under this act, and are addressed through a General NPDES permit for Stormwater Discharges Associated with Construction Activities.

Section 316 (33 USC § 1326) of the Clean Water Act specifically addresses thermal discharges and cooling water intake structures. Subsection (a) requires that "... the owner or operator of any such source ... demonstrate to the satisfaction of ... the state that any effluent limitation proposed for the control of the thermal component of any discharge from such source will require effluent limitations more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made ... the state may impose an effluent limitation ...

that will assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on that body of water.”

Subsection (b) of section 316 requires that “ ... the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.”

Section 404 of the Clean Water Act regulates the discharge of dredged or fill materials into the waters of the United States, including rivers, streams, and wetlands. The U.S. Army Corps of Engineers administers the Section 404 permit program. The application for a Dredge Permit is administered through the San Francisco Dredged Material and Management Office (DMMO). The construction of the intake and outfall structures will require an Individual Permit. This permit is issued every 10 years. Maintenance dredging is also a permitted activity. Each activity is considered an episode. Depending on the location of the dredged material, maintenance dredging will be permitted under the Individual Permit or a 2-year Nationwide Permit.

Section 401 of the Act requires that the Regional Water Quality Control Board must certify any activity that may result in a discharge into a waterbody. This certification ensures that the proposed activity will not violate state and federal water quality standards.

NUMERIC CRITERIA FOR PRIORITY TOXIC POLLUTANTS FOR THE STATE OF CALIFORNIA (MAY 18, 2000)

This rule was recently promulgated by the U.S. Environmental Protection Agency (USEPA) to fill a gap in the California water quality standards created in 1994 when a State court overturned the State’s water quality control plans which contained water quality criteria for priority toxic pollutants. This new rule provides criteria applicable in the State of California for inland waters, enclosed bays and estuaries for all purposes and programs under the Clean Water Act.

RIVER AND HARBOR ACT

Section 10 of the River and Harbor Act of 1899 specifies permit requirements for work on structures over, in, and/or under navigable waters of the United States (33 U.S.C. Section 403). The purpose of this law is to preserve the navigability of the waters of the United States by prohibiting the unauthorized obstruction or alteration of any navigable waters. The installation of the proposed outfall structures in the San Francisco Bay and the transmission line under Islais Channel require a Section 10 permit. Navigational provisions affiliated with the U.S. Coast Guard include the addition of navigational devices and a “Notice to Mariners,” which will alert boaters as to when and where obstructions to navigable waters will occur. Section 10 is administered by the U.S. Army Corps of Engineers.

STATE

PORTER-COLOGNE WATER QUALITY CONTROL ACT

The Porter-Cologne Water Quality Control Act of 1967, Water Code Section 13000 et seq., requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. These criteria include the identification of beneficial uses, narrative and numerical water quality standards and implementation procedures. The criteria for the project area are contained in the *Basin Water Quality Control Plan – San Francisco Bay Basin* (RWQCB, 1995).

The RWQCBs are also required to ensure the protection of water quality through the regulation of waste discharges to land. Such discharges are regulated under Title 23, California Code of Regulations, section 2200 et seq. These regulations require that the RWQCB issue a Waste Discharge Requirement regarding the discharge of waste (soil) into surface waters resulting from land disturbance.

CALIFORNIA WATER CODE

California Water Code § 13550 requires the use of reclaimed water, where available. The use of potable domestic water for nonpotable uses, including, industrial uses, is a waste or an unreasonable use of the water within the meaning of Section 2 of Article X of the California Constitution if recycled water is available.

California Water Code § 13260 requires that, as part of the NPDES permit, any person discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the state, other than into a community sewer system must submit a report of waste discharge to the RWQCB.

STATE WATER RESOURCES CONTROL BOARD POLICIES

The SWRCB has also adopted a number of policies that provide guidelines for water quality protection. The Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling (adopted by the Board on June 19, 1976 by Resolution 75-58) states that use of fresh inland waters should only be used for power plant cooling if “the other sources or other methods of cooling would be environmentally undesirable or economically unsound.” This SWRCB policy requires that power plant cooling water should come from, in order of priority: wastewater being discharged to the ocean, ocean water, brackish water from natural sources or irrigation return flow, inland wastewaters of low total dissolved solids, and other inland waters. This policy also defines cooling water discharge prohibitions.

The principal policy of the State Board, which addresses enclosed bays and estuaries, is the “Water Quality Control Policy for the Enclosed Bays and Estuaries of California” (adopted by the Board on May 16, 1974 by Resolution 74-43). This policy contains a number of prohibitions on waste discharges including chemical, biological and petroleum related waste.

STATE WATER RESOURCES CONTROL BOARD PLANS

CALIFORNIA THERMAL PLAN

In 1972, the State Water Resources Control Board adopted the “Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California”, more commonly known as the Thermal Plan. The Thermal Plan, which was later amended in 1975, sets limits on the discharge of wastewaters with elevated temperatures into coastal, estuarine and interstate waters in order to meet water quality objectives. A major aim of the Thermal Plan is to protect marine resources in the ocean, enclosed bays and estuaries from the adverse impacts of thermal waste.

Thermal waste is defined as cooling water and industrial process water used to carry waste heat from such large point sources as power plants. Two categories of discharges exist: “existing” which are discharges in place or under construction prior to the plan’s 1971 adoption and “new” which are discharges developed after the plan was adopted. The proposed project is considered a *new* discharge under the Thermal Plan by the RWQCB (Huang 2001). The project will be discharging to Lower San Francisco Bay using a new multipoint diffuser.

The project is a new discharge in an enclosed bay, for which the applicable water quality objectives in the Thermal Plan are:

- Elevated temperature waste discharges shall comply with limitations necessary to assure protection of beneficial uses. The maximum temperature of waste discharges shall not exceed the natural temperature of the receiving waters by more than 20°F.
- Thermal waste discharges having a maximum temperature greater than 4°F above the natural temperature of the receiving water are prohibited.

The Thermal Plan provides the authority for the RWQCB to grant exceptions to the specific water quality objectives in accordance with Section 316(a) of the Clean Water Act. Such exemptions also require the approval of the SWRCB.

CALIFORNIA OCEAN PLAN

In 1997, the SWRCB (Resolution 97-026) adopted the latest version of the Water Quality Control Plan for Ocean Waters of California (California Ocean Plan). The California Ocean Plan establishes beneficial uses and water quality objectives for the state’s ocean waters outside of enclosed bays, estuaries and lagoons. The plan also sets forth effluent limitations, management practices and prohibitions. Every three years the plan is reviewed and, if necessary, updated.

CALIFORNIA COASTAL ACT OF 1976

Chapter 3 (Pub. Resources Code §30000 et seq.). Coastal Resources Planning and Management Policies, Article 4, Marine Environment. Section 30231. This section requires that the “...biological productivity and the quality of coastal waters,

wetlands, estuaries and lakes shall be maintained by minimizing adverse effects of wastewater discharges and entrainment, controlling runoff, preventing depletion of groundwater...”

CALIFORNIA CONSTITUTION

California Constitution, Article 10, §2. The water resources of the state should be put to beneficial use to the fullest extent possible. The waste or unreasonable use or unreasonable method of use of water is prohibited and water conservation is encouraged. The right to water or to the use of the flow of water and riparian rights are to be maintained by reasonable methods of diversion and use.

LOCAL

DREDGE MATERIAL REUSE/DISPOSAL PERMIT

The San Francisco Bay Dredged Material Management Office (DMMO) aims to provide a cooperative permitting framework that reduces redundancy and expedites the processing of applications for dredging and dredged material disposal while fostering consensus decision-making primarily among the following member agencies: U.S. Army Corps of Engineers (ACOE) San Francisco District, U.S. Environmental Protection Agency, San Francisco Bay Regional Water Quality Control Board, San Francisco Bay Conservation and Development Commission, and the State Lands Commission. Because the area of expertise differs from each of the aforementioned agencies, the coordination of knowledge among DMMO staff ensures consistency throughout the permitting process.

The DMMO issues the Dredge Material Reuse/Disposal permit, which is a consolidation of Section 404 and/or Section 10 dredging permits. Section 10 of the River and Harbor Act authorizes the ACOE to issue permits related to dredging and filling operations within navigable waters of the U.S. Section 404 of the Clean Water Act regulates the discharge of dredged or fill materials into the waters of the United States, including rivers, streams, and wetlands. The Dredge Material Reuse/Disposal permit is functionally equivalent to a RWQCB Report of Waste Discharge, pursuant to Article 4, Chapter 4 of the Porter-Cologne Water Quality Control Act and will satisfy Section 401 of the Clean Water Act.

Aside from the actual dredging activity, the dredged sediment needs to be characterized for its physical, chemical, and biological properties. Each of the agencies involved conduct separate reviews and make determinations accordingly as to the issuance of the permit.

MCATEER - PETRIS ACT

The McAteer - Petris Act, which is overseen by the San Francisco Bay Conservation and Development Commission (BCDC), aims to preserve San Francisco Bay from indiscriminate filling. Section 66605(a) maintains that further filling of San Francisco Bay should be authorized only when public benefits from fill clearly exceed public detriment from the loss of the water areas and should be limited to water-oriented uses including “... water intake and discharge lines for

desalinization plants and power generating plants requiring large amounts of water for cooling purposes.” Section 66605(f) maintains that fill should be authorized when the filling would, to the maximum extent feasible, establish a permanent shoreline.

SAN FRANCISCO BAY PLAN

The BCDC is charged with determining how the future development of the Bay should proceed, the circumstances, if any, under which filling should be allowed, and the preparation of a regional plan incorporating these findings for the beneficial use and preservation of San Francisco Bay. The San Francisco Bay Plan was adopted by the Commission in 1968 and forwarded to the California Legislature and the Governor in 1969.

Part 3, Water Quality, Policy 3 maintains that soil erosion reduction methods should be incorporated into the design and construction of shoreline projects in order for the Bay to be protected from increased sedimentation.

Part 3, Water Quality, Policy 4 states that polluted runoff from projects should be controlled by the use of best management practices in order to protect the water quality and beneficial uses of the Bay, especially where water dispersion is poor and near shellfish beds and other significant biotic resources. Whenever possible, runoff discharge points should be located where the discharge will have the least impact. Approval of projects involving shoreline areas polluted with hazardous substances should be conditioned so that they will not cause harm to the public or the beneficial uses of the Bay (SF Bay Plan, 1987).

Part 4, Dredging, Policies 1-11 describe acceptable dredge operation parameters, including non-tidal and ocean disposal techniques, channel type specifications, soil erosion control measures, and the protection of underground freshwater resources.

SAN FRANCISCO PUBLIC HEALTH CODE

Pursuant to Section 1001 of the San Francisco Public Works Code, the applicant must comply with Article 22A of the City and County of San Francisco Public Health Code, formerly known as the Maher Ordinance, which governs development of properties on fill that is known or suspected to contain contaminated soils.

Under the San Francisco Building Code provisions, applicants for any building or grading permit which involves the disturbance of at least 50 cubic yards of soil shall comply with the requirement for soil sampling and analysis of Article 22A of the Public Health Code.

This ordinance provides that no building permit application subject to the requirements of this section shall be approved until the Department receives written notification from the Director of Public Health that the applicant has complied with all applicable provisions of Article 22A of the Public Health Code, or that the requirements have been waived.

SAN FRANCISCO BUILDING CODE, CHAPTER 33

The San Francisco Building Code (SFBC) adopts Chapter 33 of the Uniform Building Code (UBC) and the California Building Code (CBC), which establishes excavation, grading and erosion control standards. The standards include specifications pertaining to excavation of fills for buildings or structures, grading associated with construction of utilities, and storm water drainage.

SAN FRANCISCO MUNICIPAL CODE

Chapter X, Part II, San Francisco Municipal Code, Article 4.1, Industrial Waste Ordinance, Section 123(f) prevents discharge without a permit of any pollutants, except stormwater, directly or indirectly into a manhole, catch basin, or other opening in the sewerage system other than an approved side sewer.

SAN FRANCISCO GENERAL PLAN

The San Francisco General Plans sets out various policies pertaining to soil and water resources. Policies that pertain to soil and water resources are discussed in the following sections: new structures (policy 2.3); new development (policy 2.9); bay, ocean and shoreline (policies 3 and 4); and land (policy 3). Guidelines pertaining to soil conditions; geologic hazards; bay, ocean and shoreline area resources; water pollution, resource conservation and filling of land are described in the aforementioned policies.

SETTING AND PROJECT DESCRIPTION

ENVIRONMENTAL SETTING

The proposed Unit 7 project is located on the south-central portion of the existing Potrero Power Plant (Potrero PP) site, which is located on the eastern side of the and City and County of San Francisco (CCSF) along the western shore of San Francisco Bay. In addition to San Francisco, surrounding communities include South San Francisco and Daly City to the south, and Alameda and Oakland to the east across the San Francisco Bay. The facility is located on the San Francisco Peninsula within the northern Coast Ranges physiographic province. A north-northwest trending series of mountains and intervening valleys that extend from the Oregon border south to the Transverse Ranges of southern California characterizes the province. The plant site is bounded immediately on the east by San Francisco Bay with hills rising to the west across the San Francisco Peninsula.

The project site is essentially flat with elevations ranging from about 13 to 35 feet above mean sea level (MSL) increasing in elevation westward away from the Bay. The elevation of the proposed project site is approximately 30 feet above MSL (SECAL 2000a).

The CCSF area receives an annual precipitation of approximately 20 inches with more than 80% of the precipitation in the area occurring from November through March. The climate is characterized by mild wet winters and cool dry summers. During the winter, average low and high temperatures (°F) vary from the mid-40s to

the mid-50s, respectively. The summer average low and high temperatures (°F) range from the mid-50s to the mid-60s respectively.

SURFACE WATERS

The two surface water bodies in the vicinity of the proposed project are the Lower San Francisco Bay and Islais Creek. There are no delineated wetlands on the site (SECAL 2000b).

LOWER SAN FRANCISCO BAY

The proposed project is located on the western shoreline of the Lower San Francisco Bay, in the basin designated as Central Basin (3) by the Regional Water Quality Control Board (CRWQCB, 1995). Sub-areas of the bay in proximity to the site include the Golden Gate Channel to the north, Warm Water Cove immediately to the south, and San Francisco Bay Central to the east.

Surface waters in the area are affected by currents in San Francisco Bay in the vicinity of the Potrero PP and are dominated by tidal action. The mean tidal range at Potrero PP is 4.6 feet. The average incoming flood tides flow southward at approximately 2.5 knots, while outgoing ebb tides flow northward towards the Golden Gate at approximately 2.3 knots (SECAL 2000b).

Salinity in this area of Lower San Francisco Bay varies significantly both seasonally and during the tide cycle. Salinity is lower in the winter due to the larger fresh water inflow to the Bay, with concentrations as low as 12 parts per thousand (ppt), while in the summer, salinity is on the order of 30 ppt. The annual average is 28 ppt (SECAL 2000a).

Seasonal water temperatures in San Francisco Bay vary geographically with depth, tidal influence, and ambient temperatures. Water temperatures taken at the existing Potrero PP Unit 3 electrical generation plant intake between November 1997 and April 2000 show daily averages ranging from a minimum of 43.6°F to a maximum of 63.7°F with an average of 55.7°F (SECAL 2000a).

Lower San Francisco Bay is on the 303(d) list of impaired water bodies relative to chlordane, copper, DDT, diazinon, dieldrin, dioxin components, exotic species, furan compounds, mercury, nickel, and polychlorinated biphenyls (PCBs).

Beneficial uses of the local waters for San Francisco Bay Central, located immediately to the east of the site, as determined by the Regional Water Quality Control Board are (CRWQCB, 1995):

- ocean, commercial, and sport fishing
- estuarine habitat
- industrial service supply
- fish migration
- navigation
- industrial process supply

- preservation of rare and endangered species
- water contact recreation
- non-contact water recreation
- shellfish harvesting
- fish spawning

ISLAIS CREEK

Islais Creek was historically part of the Islais Creek estuary; however, over the years, artificial fill consisting of sand, rock, and garbage from former city dumps have completely reclaimed the estuarine environment. No hydrologic or hydraulic data has been provided. The proposed underground transmission line from Unit 7 to the existing Hunters Point Substation will cross under Islais Creek.

GROUNDWATER

The proposed Unit 7 site is underlain by Franciscan complex serpentine bedrock and Quaternary alluvium. The eastern portion of the site is underlain by approximately 30 feet of artificial fill that consists of construction rubble and bedrock. The artificial fill overlies Bay Mud deposits. The fill and fractured bedrock serve as a water-bearing unit for the brackish groundwater; however, the Bay Mud that underlies the fill in the eastern portion of the site restricts any vertical movement of groundwater. The Depth to groundwater ranges from approximately 3.5 feet below ground surface around the central portion of the site to approximately 21 feet below ground surface near the bay. Groundwater flow is generally towards the east-southeast with an upper gradient of 0.02 and a lower gradient near the eastern portion of the site of approximately 0.006.

The quality of groundwater beneath the site area is brackish, with total dissolved solids (TDS) between 300 and 28,600 milligrams per liter (mg/L) with an average TDS of 4,500 mg/L. The State Water Resources Control Board Resolution No. 88-63 indicates that groundwater with TDS exceeding 3000 mg/L is not considered suitable for municipal or domestic water supply. Due to the levels of TDS in the groundwater, it is not considered usable for drinking and treatment is considered too expensive to be practical for municipal purposes (SECAL 2000a).

GROUNDWATER CONTAMINATION

Groundwater contamination at the site was considered possible by a Phase I Environmental Site Assessment (CDM, 1997), although no groundwater sample was actually collected. Groundwater contamination was found during the Phase II Environmental Site Assessment (Fluor Daniels GTI, 1998) and an additional Site Characterization study (Geomatrix, 2000). The following contaminants were detected: Total petroleum hydrocarbons (TPHs), benzene, poly-aromatic hydrocarbons (PAHs), metals, volatile organic compounds, and cyanide. In general, the contaminant concentrations were relatively low, but some exceeded regulatory thresholds. A more complete description of groundwater contamination is included in the **Waste Management** section of this PSA. In addition to dissolved contaminants, light and dense non-aqueous phase liquids (LNAPL and DNAPL) were found. In the vicinity of the excavation footprint, DNAPL thickness ranged

from about 3 to 14 feet, at a depth of about 35 feet below ground surface. Leachability tests indicated that the DNAPL has the potential to leach dissolved constituents.

OFFSHORE CONTAMINATION

Mirant conducted offshore sediment sampling at approximately 12 locations. The sediment sampling locations, labeled PP-1 through PP-12, are approximately 50 to 250 feet offshore in the vicinity of the originally proposed Units 3 & 7 intake/outfall structures. Sediment cores down to 12 feet deep were collected every 3 feet. The sediment samples were tested for total solids, total organic content (TOC), metals, PCBs, pesticides, TPHs, and PAHs. Some samples were tested for cyanide, volatile and semi-volatile organic compounds (VOCs/SVOCs).

The sampling results revealed elevated amounts of PAH concentrations at three near-shore areas, with the highest PAH concentration approximately 65 feet west and 50 feet north (PP-1) of the existing Unit 3 cooling water intake. The analysis showed increasing levels of PAHs as the depth increased. The 3 PAH indicator chemicals are benzopyrene, pyrene, and naphthalene. Naphthalene was discovered in the deepest sample. Other sampling locations revealed lower levels of PAHs. Most other aforementioned compounds were at or slightly above background levels (SECAL 2000Seds1). Refer to the **Waste Management** section of the PSA for further discussion.

A second offshore sediment sampling analysis was conducted during January 2001; however, Energy Commission staff received information pertaining to this analysis too late for consideration in this PSA.

SOILS

The Potrero PP site is located in the northern Coast Ranges, a series of northwesterly-trending ridges. The site is underlain with Franciscan complex serpentine bedrock and Quaternary alluvium. The eastern part of the site is underlain with approximately 30 feet of fill, consisting of rubble and reworked bedrock. The fill overlies Bay Mud deposits. Bedrock is exposed in a ridge on the northwestern corner of the site. The eastern third of the plant is reclaimed land, the former shoreline projects in a roughly north-south direction across the plant site. The reclaimed land is comprised of artificial fill overlying former alluvium and estuarine deposits of Islais Creek. The fill consists of a heterogeneous mixture of sands, gravels, and silts with abundant rubble and debris that ranges up to approximately 45 feet in thickness (SECAL 2000a).

The proposed Unit 7 facility will be located on Urban Land (Map Unit 131) soils whereas the underground transmission line will be located on Urban Land – Orthents, Reclaimed Complex, 0 to 2 Percent Slopes (Map Unit 134) soils (SECAL 2000a). The Urban Land soil type is characterized as having more than 85 percent of the surface covered by paving and various structures. The slopes of this soil type range from 0 to 5 percent. The Urban Land and Urban Land – Orthents, Reclaimed Complex, 0 to 2 Percent Slopes soil type has various aggregate components such

as soil, gravel, concrete and asphalt rubble, solid wastes, and Bay Mud. This soil type is very deep with poor drainage conditions.

SOIL CONTAMINATION

Soil contamination was identified in a Phase I Environmental Site Assessment (CDM 1997). This included apparent contamination by organics and heavy metals, tank and drum storage on unpaved areas, unknown constituents in the artificial fill in the eastern part of the site, and a possible 1988 asbestos release. Soil contamination was further characterized during the Phase II Environmental Site Assessment (Fluor Daniel 1998) through the analysis of soil samples in areas identified in the Phase I assessment. Contaminants identified in the site soils included total petroleum hydrocarbons (TPHs), polynuclear aromatic hydrocarbons (PAHs), metals, volatile organic compounds (VOCs), cyanide, polychlorinated biphenyls (PCBs), phenolic compounds and asbestos. Further details on these contaminants are provided in the **Waste Management Section** of this PSA.

EXISTING POTRERO POWER PLANT

The Potrero PP Unit 7 site has a long history of industrial operations. Land fill operations began around 1870 and continued until 1910. The earliest industrial operations began in 1872, when the site was used for a manufactured gas plant. The plant was constructed at the northern portion of the existing Potrero property. Subsequent industrial operations at the Potrero property include sugar refining, coal gasification, power generation, and a barrel manufacturing facility.

The Potrero PP facility currently consists of the existing Unit 3 gas fired conventional steam turbine/boiler unit rated at 206 MW, and Units 4, 5, and 6 which are each 52 MW combustion turbine units. Units 4, 5, and 6 are currently used primarily for electricity peaking needs and fueled by distillate oil. Mirant expects to maintain all generating units at the Potrero PP site available for the foreseeable future. (SECAL 2000a). The conventional technology used for the existing Unit 3 produces high-pressure steam in a boiler that is fueled by natural gas and directs the steam to a steam turbine that drives a generator to produce the electricity. Unit 3 uses seawater to cool the steam that is exhausted from the steam turbine into a condenser. The seawater is drawn from the San Francisco Bay, passed through a non-direct contact condenser, and returned to the Bay. The existing seawater intake structure is located on the waterfront near the northeast corner of the project site. The design water flow for Unit 3 is 157,000 gallons per minute (gpm) for the circulating water and 4,000 gpm for water wash (SECAL 2000a).

Mobile truck mounted demineralizers supply process water for make-up to the steam cycle of Unit 3 at a rate of up to 400 gpm. Raw water is fed to the demineralizers from the CCSF. The water treatment vendor owns the units. Regeneration of the catalyst beds and other maintenance cycles are performed offsite at the vendor's facilities. Wastewater from the demineralizer is considered to be of drinking water quality. However, it will be disposed of directly into CCSF's stormwater system.

The existing onsite potable water supply serves the personnel needs of the plant staff along with miscellaneous equipment cleaning and cooling requirements. Currently approximately 35 personnel work onsite as permanent staff. This number will increase by approximately 10 people with the operation of the new unit.

WASTEWATER

Currently, sources of wastewater generated by power plant operation and maintenance include seawater that has been circulated through the plant condensers, discharge of intake screen wash, evaporator cooler blowdown, boiler blowdown, washwater, floor drain water, sanitary waste, and other miscellaneous plant liquids. The existing plant is operated under a NPDES permit (No. CA 0005657) by the San Francisco Regional Water Quality Control Board. This permit describes the existing discharge as a once through system with an annual average flow of 226 million gallons per day (mgd) (approximately 157,000 gpm) at a condenser temperature rise of 15°F.

COOLING WATER DISCHARGE

Currently, the Potrero PP Unit 3 discharges cooling water through a channel outfall cut into the seawall. At full power production (210 MW), the discharge flowrate is 157,000 gpm with a temperature rise of 19°F. A characterization of the thermal plume was conducted in 1989-90 (PG&E, 1991). The plume extends north during ebb tide and south during flood and the size of the plume varies during the tide cycle and as a function of the plant load. At full load, the 4°F temperature rise above ambient temperature isotherm (line of constant temperature) has a length of 1,000 to 2,000 ft (SECAL 2000a - Appendix G). The thermal plume reaches the shore over varying lengths.

ENVIRONMENTAL IMPACTS

PROJECT SPECIFIC IMPACTS

WATER SUPPLY

The Unit 7 addition will consist of one new combined cycle unit using two GE 7FA natural gas fired combustion turbines, two heat recovery steam generators (HRSG), and one steam turbine. Unit 7 will have a nominal rating of 540 MW. The actual output of the unit will vary in response to ambient air temperature conditions, use of evaporative coolers, power enhancement to the combustion turbines, and the use of supplemental firing (duct firing) in the HRSGs to increase steam pressure. Full load output of the unit under expected operating conditions (both combustion turbines and steam turbine generator running) will range from approximately 527 MW net to a peak of 615 MW net (SECAL 2000a). Water needs will include circulating cooling water, combustion turbine evaporative cooler make-up, steam cycle water make-up, utility water, potable water, and miscellaneous uses.

Water from the San Francisco Bay will be used in the heat rejection cycle providing cooling water to the non-direct contact surface condenser that condenses steam

from the exhaust of the steam turbine. Additionally, water from the Bay will be circulated through plant service water coolers. The cooling water for the condenser and the service water coolers will be discharged back to the San Francisco Bay. The circulating water requirement for Unit 7 will be approximately 158,000 gallons per minute (gpm) or 228 million gallons per day (gpd) and 4,000-gpm screen wash water. This flow consists of 148,000 gpm for the steam cycle condenser and 10,000 gpm for the service water cooling system. To obtain the circulating water, a new intake structure will be constructed with sufficient capacity to withdraw water for the cooling requirements of both the existing Unit 3 and the new Unit 7. Unit 3 requires 157,000 gpm, thus the new intake system will have a capacity of 315,000 gpm (SECAL 2000a).

Evaporative coolers are used on the inlets to the combustion turbines to improve the output of the units during periods of high ambient temperatures. Since the combustion turbines generate power using the expansion of hot gases through a power turbine they are sensitive to the mass flow of air through the machines. The air is less dense in high ambient temperatures and therefore the amount of power produced is reduced. By circulating water across media at the turbine air inlet, the effect from evaporation reduces the inlet air temperature thereby increasing the air density and thus the output of the turbine. Water is made up to the evaporative coolers to replace that which is lost due to evaporation and blowdown. CCSF will provide evaporative cooler make-up water to the plant.

Make up process water will be required for the steam cycle to replace losses as well as water that is blown down to maintain purity. Process water for make-up to the steam cycle will be demineralized water produced by mobile truck mounted demineralizers. Raw water will be fed to the demineralizers from the CCSF water system. The water treatment vendor will own the demineralizer units. Regeneration of the catalyst beds and other maintenance cycles are performed offsite at the vendor's facilities. Other plant water uses for demineralized water will be wash water for equipment maintenance, and make-up water to the closed loop service water cooling system. This system will provide cooling water to other plant equipment. This system will operate in parallel with the steam condenser, providing service water to the combustion turbine and steam turbine lube oil coolers, the steam turbine generator hydrogen coolers, the condenser vacuum pump coolers, the feed pump coolers, and the combustion turbine generator coolers. The service water heat exchanger has a design flow of 10,000 gpm (SECAL 2000a).

Potable water uses will include utility services such as wash down of equipment areas, potable and sanitary use, and firewater. Potable water will be provided by the City of San Francisco.

Table 1 shows the estimated daily water requirements at average daily and annual operations.

SOIL & WATER RESOURCES TABLE 1
Unit 7 Daily Water Requirements

Water Use	Source	Average Requirements (gpm) ^a	Average Annual Requirements (gpm) ^b
Circulating Water Make-up	San Francisco Bay	158,000	158,000
Evaporative Cooler Make-up	City Water Supply	50	13
Steam Cycle Make-up	City Water Supply (Expanded Demineralized Water System)	23-131	36
Potable Water	City Water Supply	1	1
Equipment Wash Water	City Water Supply	1	1

Notes:

^a Range of operating conditions averaged daily over 24 hours

^b Average total annual requirements as hourly use

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WATER QUALITY

Wastewater disposal can lead to soil, surface, and groundwater degradation and impairment of beneficial uses.

WASTEWATER DISCHARGE

Mirant proposes to discharge the spent cooling water from the existing Unit 3 and the proposed Unit 7 through separate outfalls. Each discharge will consist of a pair of 54 inch diameter pipes laid on the bottom of the Bay and extending offshore approximately 900 feet using a diffuser configuration (SECAL 2000a).

The chemicals that will be used to clean the intake and discharge structures are sodium hypochlorite and sodium bisulfate. The cooling water will initially be dosed with sodium hypochlorite, which will be converted to chlorine to treat microfouling. The sodium bisulfate will then be added and will act as a chlorine scavenger, removing the chlorine before it can be discharged into the Bay. Heat treatment will also be used to demussel the cooling water system. Using a bypass, water will be recirculated to increase the temperature in the system to thermally shock and dislodge organisms that become attached to the walls of the system. The heated water will then be mixed with cooling water and discharged to the Bay. Heat treatments are expected to be performed not more than twice per month (SEP2001Dres3, Data Response No. 166). The applicant is expecting that the temperature rise for the new combined cycle unit will be 20°F. The applicant submitted an application for a new NPDES permit to the RWQCB on May 17, 2001.

The HRSG and evaporative cooler blowdown will be discharged to the circulating water system outfall. Equipment washdown water will be collected and removed from the site for disposal. Building drains and sanitary wastes will be discharged to the sewer. Water collected from floor drains and equipment containment areas will be treated in the oil/water separator. Oily waste will be retained by the separator and eventually will be disposed of off-site, whereas the filtered water will be discharged to the sewer. SOIL & WATER RESOURCES Table 2 identifies the quantity and discharge location for each of the major wastewater streams.

SOIL & WATER RESOURCES TABLE 2
Wastewater Streams

Source	Average Flow gpm	Maximum Flow gpm	Discharge
Circulating Water	148,000	148,000	San Francisco Bay
Service Water Cooling	10,000	10,000	San Francisco Bay
Evaporative Cooler Blowdown	12.5	25.0	San Francisco Bay
HRSG Blowdown	22.0	76.0	San Francisco Bay
Equipment Wash	0.12	81.0	Offsite disposal
Turbine/Building Drains	0	10.0	City Sewer
Sanitary Waste	1.04	20.0	City Sewer
Stormwater Runoff	3.74	500	San Francisco Bay and City Sewer
Floor/Equip Containment Drains	0.21	270.0	Oil/Water Separator
Oil/Water Separator Treated Water	0.21 less contaminants	270.0 less contaminants	City Sewer

SECAL 2000a, AFC page 2-51

CCSF will continue to supply potable water that is used for steam cycle make-up after treatment by the polishing demineralizer. As previously indicated, the demineralizers will be provided by a vendor service.

Total wastewater discharge from Unit 7 would be approximately 158,039.82 gpm (227 million gpd), which is approximately an additional 1 million gpd rate compared to the existing discharge. Total combined discharge from the existing and proposed units would be approximately 453 million gpd.

SPILL PREVENTION

The applicant has provided a number of provisions for spill prevention control and countermeasure (SPCC). These provisions cover chemical spill control and management of the hazardous materials that will be stored and used on the site (refer to the **Hazardous Materials Management** section of this PSA for more information). As described in Section 8.12 (page 8.12-2) of the AFC, hazardous materials at Unit 7 would be stored indoors in a concrete containment area that surrounds the aqueous ammonia storage tanks. The containment area would be

designed to slope steeply to drain spills quickly into a covered underground sump. A containment area/drain would be provided under the tanker truck unloading position to drain the spills directly into the covered sump.

Some of the hazardous materials used during construction include petroleum hydrocarbons, cleaning fluids and solvents. Waste generated during construction will be taken to a temporary waste storage facility onsite then transported to an authorized waste management facility. The majority of hazardous material stored onsite during operation of the proposed Unit 7 will be aqueous ammonia used in the Selective Catalytic Reduction (SCR) system. This material would be stored in aboveground storage tanks that would be surrounded by a containment berm. Other containment/treatment facilities include curbs, berms, concrete pits, and use of double-wall piping (when feasible) to minimize potential of a release from ruptured piping. Containment areas will be drained to appropriate collection sumps or neutralization tanks for recycling or off-site disposal. (SECAL 2000a).

STORMWATER RUNOFF

There will be no change in impervious area or runoff within the existing 6.5 acres where Unit 7 will be constructed, therefore, stormwater runoff will not be changed with the addition of Unit 7. Stormwater runoff will be directed to existing catch basins and directed into the San Francisco Bay via outfalls E-003 to E-005 and/or to oil water separators then into the city sewer system (SECAL 2000b).

Stormwater runoff that does not discharge directly into the San Francisco Bay will need to pass through an oil/water separator prior to being discharged to the city sewer system. The oil/water separator system is used to collect and process oil-laden stormwater. The water separated from the oil is directed into the city sewer system and the oil is pumped into a 2,000-gallon sludge oil tank then transported for offsite recycling. Specific areas of the Unit 7 facility where stormwater runoff will be directed to an oil/water separator include the Fuel Tank Farm and Power Generation Area. The Switchyard area directs flow into a retention pond then releases the stormwater to city storm drains. The Non-Operational Area and Customer Energy Services/Safety, Health and Claims Area direct flows to the city sewer system. The Power Generation and Operations Area is equipped with a valve system that allows for a visual inspection of the stormwater prior to discharge. If oil is detected in the stormwater, then the flow is directed to the oil/water separator system (SECAL 2000b).

The applicant has indicated that the existing storm sewer system will be capable of handling the runoff from Unit 7 due to no change in impervious area. Calculations have been provided for the catch basin and outfall systems E-003, E-004, and E-001. Pipeline information was not available for Outfall E-005 and the Unit 7 area (Mirant 2001c). If any of the existing storm sewer system is discovered to be undersized due to current standards, runoff from the proposed Unit 7 facilities could be handled separately to minimize impacts to the existing system.

SOILS EXCAVATION AND DEWATERING

Construction of the project will entail excavation of contaminated soils. The applicant prepared a Site Mitigation and Implementation Plan (SECAL 2000a - Appendix D) that discusses options as to the handling of the contaminated soils. These options include onsite reuse and offsite disposal. Onsite reuse is contingent on acceptable risk to construction workers or future industrial workers, and must be approved by appropriate agencies (RWQCB, DTSC and/or SFDPH). Refer to the **Mitigation** section below for further information regarding concerns from the respective agencies. Offsite disposal will depend on the degree of contamination of the soils. The Site Mitigation and Implementation Plan does not provide actual disposal plans, or testing procedures to be implemented to guide the disposal process. Disposal of hazardous materials is further discussed in the **Waste Management** Section of this PSA.

Groundwater dewatering will be required for certain phases of the construction, primarily for the installation of the cooling water intake and discharge conduits. Sufficient hydraulic testing of the aquifer has not been conducted to allow an estimation of the required dewatering flowrates. However, near the Bay, relatively large dewatering flowrates may be necessary. Dewatered groundwater can be disposed of by several means including onsite infiltration in trenches, discharge to San Francisco Bay, or discharge to the municipal sewerage system. Each of these alternatives requires specific approval and suitable water quality. While groundwater contamination was found in several locations at the site, it appears that essentially no exceedence of San Francisco Bay Batch Wastewater Discharge Limits occur in the areas to be dewatered. Disposal of dewatering groundwater will probably not cause significant impacts. Nevertheless, while several disposal means are discussed in the AFC, no specific plan is mentioned in the Site Mitigation and Implementation Plan (SECAL 2000a - Appendix D). Staff recommends that a dewatering disposal plan be prepared and approved prior to initiation of construction (SOIL & WATER 6).

COOLING WATER SYSTEM

COOLING WATER WITHDRAWAL

To meet the requirements of both the existing Unit 3 and the new Unit 7, a new intake structure will be constructed to replace the existing intake. It will be located on the shoreline near the southern boundary of the plant site and will be designed to provide sufficient flowrates for both Unit 3 and Unit 7. Therefore the total intake cooling water flow will be increased from the current 157,000 gpm to 315,000 gpm. Energy Commission staff has recently received revised data pertaining to the intake structure and will provide a further evaluation discussion in the Final Staff Assessment (FSA).

COOLING WATER DISCHARGE

Mirant is proposing to discharge the cooling water from the new Unit 7, as well as the existing Unit 3, back to San Francisco Bay using multiport diffusers. The cooling water flowrates for Units 3 and 7 are respectively 153,000 and 158,000

gpm, including service water. The temperature rise is 20°F. Thus, the combined waste heat loading of the existing Unit 3 and proposed Unit 7 will be double the current Unit 3 loading to San Francisco Bay.

A new multiport diffuser design has been proposed by Mirant, changing the design specified in the AFC. Two 200-ft long diffusers at the terminal ends of the 900 foot-long discharge pipes would be used for each of Units 3 and 7, in depths of 20 to 28 ft below MLLW (Mirant 2001 IntOut). These diffusers should provide better dilution of the thermal effluent with ambient waters than the existing Unit 3 discharge, however, as mentioned above, the waste heat load is doubled. See **Project Description** Figure ____ for further description.

Thermal demusseling, which is performed up to twice a month, involves discharging cooling water through the intake to dislodge mussels in the intake system. Current practices involve a discharge temperature of 100°F for four hours, with a maximum of 110°F.

At this time, insufficient details have been provided to allow an evaluation of the diffusers performance relative to the California Thermal Plan, or an evaluation of impacts to the biota. The required information includes details of the diffuser design (port number, spacing, diameter and orientation) and a characterization of the thermal plume in terms of plots of temperature rise isotherms at different times in the tide cycle. Because the currents are reversing in direction, some re-entrainment of previously discharged heat will occur and this needs to be taken into account in the plume characterization. As the plume will be vertically mixed over the water depth in the discharge area, a two-dimensional model would be an appropriate tool to provide plume characterization. The USEPA PLUMES model, which was used in the AFC to predict effluent dilution, is not applicable to this outfall because it will have a vertically mixed zone of initial dilution. Therefore, the USEPA PLUMES model should not be applied for the required thermal plume characterization.

COOLING WATER ALTERNATIVES

SWRCB Policy 75-58 states that the source of power plant cooling water should come from the following sources in order of priority:

1. Wastewater being discharged to the ocean.
2. Ocean water.
3. Brackish water from natural sources or irrigation returns flow.
4. Inland wastewaters of low total dissolved solids.
5. Other inland waters.

The use of wastewater as a source for cooling Unit 7 would require the construction of a wet cooling tower system to replace the proposed seawater cooling water system. Wet cooling towers act as heat exchangers, taking water that is used to condense steam from the steam turbine cycle in the surface condenser, and exposing it to the air to remove the heat that has been absorbed. A portion of the water is evaporated in the cooling process and the remainder is collected and recycled back to the steam condenser. The use of wet cooling towers, rather than a

once through cooling system that uses water from the San Francisco Bay, would require make-up water to replace that lost through evaporation. Also, as water is evaporated from the cooling tower, the minerals in the water concentrate and will form scale that inhibits the operation of the cooling tower. To control the water quality of the cooling tower a portion of the water is expelled as blowdown and is normally replaced with make-up water. The make-up water would be either fresh water supplied by the local water agency or reclaimed water from a wastewater treatment facility. The use of potable water as a source of make-up to the cooling tower is less preferable than a once through cooling system using water from the Bay. However, using reclaimed wastewater as make-up has a higher preference than ocean water or fresh water.

Depending on the quality of the reclaimed water, the requirements of the plant would range between 2.9 and 4.4 million gallons per day (mgd). Effluent or blowdown from the cooling towers would be returned to the wastewater treatment plant either through the sewer system or through a dedicated pipeline. The City and County of San Francisco's Southeast Water Pollution Control Plant would most likely provide reclaimed water. The effluent from the water treatment plant is currently treated to secondary standards and would require further treatment to be used in a cooling tower application. This plant is located approximately 1.2 miles from the Potrero PP site and would require a new pipeline for delivery of the cooling tower make-up water.

Staff is currently addressing the use of wastewater effluent for the Unit 7 project, and will provide further analysis in the FSA.

EROSION AND SEDIMENTATION

POWER PLANT CONSTRUCTION AND OPERATION

Accelerated wind and water-induced erosion may result from earthmoving activities associated with construction of the proposed project. Activities that expose and disturb the soil leave soil particles vulnerable to detachment by wind and water. Most of the annual precipitation in the San Francisco area is contributed during the mild, wet winters. Prolonged periods of precipitation, or high intensity and short duration runoff events coupled with earth disturbance activities can potentially enhance onsite erosion eventually resulting in increased sediment load within nearby receiving waters.

The applicant has indicated that the soil sensitivity related to erosion within the proposed Potrero PP facility is low (SECAL 2000a). However, all soils are highly susceptible to erosion upon removal of any vegetative, asphalt, or gravel cover and the commencement of earthmoving activities.

The proposed Unit 7 facility would affect approximately 6.5 acres within the approximate 20-acre site. The total volume of soil to be excavated for the entire project would be approximately 39,600 cubic yards (cys) (Mirant 2001 DRespCBE, Data Response No. 15). The grading procedure will occur as a mass excavation bringing the plant area to an approximate elevation of 20 feet MSL. The main plant

area will be excavated to a depth of approximately 6 feet (SECAL 2000a). The applicant has not identified individual acreage amounts associated with construction parking, trailers, and laydown areas. Excess soil not suitable as backfill will be delivered to an offsite disposal area. The applicant has not identified amounts of excess fill material or locations.

Offshore dredging will be necessary for the installation of the intake structure that will service Units 3 and 7 and is discussed in a subsequent section of this PSA. The applicant has not provided any drawings depicting the locations of Best Management Practice (BMP) related facilities. Refer to the **Mitigation and Conclusions and Recommendations** sections of this PSA for a further discussion on Erosion and Sedimentation.

PIPELINE CONSTRUCTION AND OPERATION

Temporary and permanent disturbances related to construction of linear facilities (pipelines) are expected to occur within the existing Potrero PP site. The gas pipeline for Unit 7 will connect to the existing 36-inch line. The line enters the Potrero PP on the south side of the site. The proposed 16" natural gas pipeline would be installed across slopes ranging from 0 to 5 percent (SECAL 2000a).

Potable water for Unit 7 will be supplied via the existing onsite water line. Potable water to the site is supplied by CCSF, which in turn is supplied through the Hetch Hetchy Water and Power System (HHWP) (SECAL 2000b). The applicant has not identified locations, sizes or lengths of proposed water supply pipelines that will interconnect with the existing Potrero PP site.

Stormwater flows associated with the proposed Unit 7 site will be directed to the existing stormwater management system which conveys flows to the San Francisco Bay via outfalls E-003 – E-005 and existing manholes into the San Francisco sewer system (SECAL 2000b).

TRANSMISSION FACILITIES

Two 115-kV transmission cables will connect Unit 7 to the PG&E Hunters Point Substation via an underground route. The transmission route will begin at the corner of Illinois Avenue and 23rd Street, continue to the terminus of Illinois Avenue, follow an abandoned railroad right-of-way, cross under Islais Creek, then follow Cargo Way to Jennings Street, Jennings Street to Evans Avenue and down Evans Avenue where it finally connects to the Hunters Point Substation. The total length of the underground transmission line is approximately 9,400 feet.

Transmission line construction through in-street and abandoned rail right-of-ways will be installed via a direct burial process. The direct burial process would consist of 6'X6' trenches excavated in six 1,500-foot lengths. This activity would traverse slopes ranging from 0 to 2 percent. The Orthents soil type consists of soil, gravel, concrete and asphalt rubble, solid wastes and Bay Mud (SECAL 2000a). In order to minimize soil disturbance and traffic congestion, no more than two trench excavations will be active at one time. During construction, clean material will be placed along side the trenches and all excavated material will be immediately

removed from the site. Upon installing the cable, the trenches will be immediately covered with backfill. The total amount of excavation for in-street and rail-right-of ways will be approximately 7,833 cubic yards (cys). Particular care will need to be taken regarding the amount of open trench at any given time and the proximity of stormwater inlets. Provisions associated with transmission line construction within roadways are provided in the Mitigation section of the PSA. (SECAL 2000a). The applicant has not identified stockpile storage or disposal areas, but has indicated the construction laydown area as a possible location.

Because this activity involves over 50 cubic yards of excavation, the applicant will need to provide a site history that involves soil sampling and analysis as per the Maher Ordinance. In the event that hazardous soils are encountered, a site mitigation report would need to be prepared and the soils disposed of at an approved hazardous materials disposal site (SECAL 2000a). Refer to the **Compliance with LORS** section below for further discussion.

The applicant has noted that earth disturbance for the transmission line construction will require direct boring under Islais Creek. The total bore distance will be approximately 850 feet. The disturbance on the side of the drill rig will be an area of 50 feet wide by 150 long with a depth of 10 feet inside this area. This assumed depth is for the bore entry point. Two 30-inch high-density polyethylene (HDPE) pipes will be installed under the watercourse. The pipe insertion side of the bore area will require an approximate area of 25 feet by 50 feet. The depth of the bore beneath Islais Creek will range from approximately 20 to 30 feet below the bottom of the watercourse. One component used along with machinery is bentonite clay. The clay, mixed with water from the creek, will provide a slurry used to power the cutting head of the drill and will provide stabilization within the hole to prevent a collapse. The applicant indicates that frac-out impacts would be minimized by locating the boring through bay mud materials, obtaining geotechnical information, and pressure control of the drilling fluid (SEP 2001Dresp3, Data Response No. 167). Staff provisions regarding direct boring are provided in the **Mitigation** section below.

ROADS

The access road for the proposed Unit 7 project will be the existing road located at the southern and western sides of the site. Direct access to the site would be via Illinois Avenue and 23rd Streets. The applicant has not identified the need to construct any new onsite roads.

INTAKE/DISCHARGE STRUCTURE CONSTRUCTION

STRUCTURE LOCATION AND DESCRIPTION

In light of the sampling results of the offshore sediment analysis, the applicant has recently relocated the Unit 3 and Unit 7 cooling water intake structure. The intake structure will be located between the Unit 3 and Unit 7 diffusers. The offshore sediment analysis conducted during January – February 2001, indicated elevated amounts of contaminated sediments in the original proposed intake location.

Relocating the intake structure would minimize the impact of disturbing and exposing existing contaminated sediments in that location.

The originally proposed locations for the discharge structures would remain the same. The Unit 3 location would consist of two 54" pipes that will extend approximately 900 feet bayward from the existing Unit 3 discharge location with the diffusers consisting of the last 200 feet. The Unit 7 discharge structures would consist of the same dimensions as the Unit 3 pipes; however these pipes would be located approximately 200 feet south of the Unit 3 structures (Mirant 2001d). The applicant has indicated that a further detailed description of the intake and outfall structures would be provided in the near future. Further discussion and evaluation will be provided in the FSA.

STRUCTURE EXCAVATION AND DREDGING

Prior to excavation for the intake structure, the applicant will employ BMPs that will consist of a silt curtain and cofferdam system. The anchored silt curtain would serve to retain any sediment that may become suspended during the installation of the cofferdam. The cofferdam would consist of sheet pile that would be embedded to bedrock in a rectangular formation. Water within the cofferdam would then be pumped into the bay to allow for dry working conditions during the installation of the intake structure. Any suspended sediments within the cofferdam area would be allowed to settle and/or treated with flocculants, which would reduce impacts to the bay during the pumping process (SEP2001Dresp3, Data Response No. 165). The applicant indicates that a similar preconstruction methodology would be followed for the construction of the Unit 3 and Unit 7 discharge structures.

The discharge structures for Units 3 and 7 would be placed on the surface of the bay and be anchored by a marine mattress. The applicant has indicated that no dredging would be required for the Unit 7 discharge structure and approximately 190 yd³ of material would be dredged for the Unit 3 structure. Dredging operations and the Units 3 and 7 structures would encompass approximately 152,200 square feet (Mirant 2001e). Construction equipment to be used would include but not be limited to: barges, a crane, hauling vehicles, excavator, tugboat and a pile driver. The anticipated construction time frame would range from approximately 18-24 months with intermittent breaks due to biological issues (SEP2001Dres1, Data Response No. 19).

The applicant has indicated that the silt curtain is intended to trap sediment, not waterborne contaminants, and that the threat of free floating hydrocarbons would be low due to dense tar like residue that currently exists at the site (Mirant2001DResSAEJ1, Data Response Nos. 138-140). The applicant further indicates that any potential permanently exposed sediment would be dealt with by using cofferdams and engineered caps (Mirant2001DResSAEJ2, Data Response No. 196).

Total dredging required for the front of the intake structure would be approximately 4,050 yd³ that would encompass approximately 27,750 square feet. Construction within the cofferdam would involve excavation for the concrete base, intake

structure, screens, and other facility-related parts. Drawings that depict the aforementioned construction process have not been provided at this time. The applicant has indicated that further information regarding the intake/outfall structures will be discussed at an upcoming DMMO meeting.

STATION A DEMOLITION

Prior to construction of the proposed Unit 7 facilities, five abandoned structures referred to as the Station A Complex will need to be demolished. A nearby metal shop building will also be demolished. The buildings will be razed via a crawler crane and hydraulic excavator. Skid loaders and Bobcats will be used to gather the building debris. All debris will be contained within the respective demolition areas before being recycled onsite or transported to offsite disposal areas and/or recycling facilities.

Fugitive dust can result during the demolition of the buildings. Excessive dust, coupled with runoff from a precipitation event, can enter storm drain inlets and pose water quality problems within a receiving watercourse. The applicant has indicated that all demolition debris will be sprayed with water and onsite inlets will be protected to control fugitive dust and contaminated runoff (SECAL 2001a).

CUMULATIVE IMPACTS

COOLING WATER DISCHARGE

The following discharges occur near the Potrero plant: (1) San Francisco Drydock, Inc (NPDES Permit CA0005321) about 1,500 ft north of the site, (2) San Francisco Southeast Sewer Plant, (NDPES permit CA00037664), about 2,500 ft south of the site and (3) San Francisco Southeast Sewer Discharge: Quint Street Outfall (NPDES permit CA0037664), about 2,800 ft up Islais Creek from the Bay. Since there is no thermal plume information available on these three discharges, cumulative impacts of these discharges cannot be estimated without a proper characterization of the Potrero PP thermal plume.

EROSION AND SEDIMENTATION

Construction and operational activities related to the Unit 7 project may cause accelerated wind and water erosion. However, implementation of the proposed mitigation measures in the SWPPP as part of the NPDES requirements would ensure that Unit 7 would not contribute to cumulative erosion and potential sedimentation impacts related to nearby projects.

FACILITY CLOSURE

The Unit 7 project is expected to operate for a minimum of 40 years. Closure options range from “mothballing,” with the intent of a restart at some time, to the removal of all equipment and facilities.

The facility closure plan will be submitted to the California Energy Commission for approval prior to decommissioning. Compliance with all applicable LORS, and any

local and/or regional plans will be required. The plan will address all concerns in regard to potential erosion and impacts on soil and water quality.

MITIGATION

APPLICANT'S PROPOSED MITIGATION

COOLING WATER INTAKE

The Applicant has concluded that the proposed cooling water intake structure design is consistent with the requirements of 316(b) because of the following features (SECAL 2000a):

- design approach velocity of 0.4 fps
- effective screen opening of 5/32" (4.0mm) with wedge wire screen
- the use of inclined traveling screens
- the use of a screen wash system to return biological organisms

EROSION AND SEDIMENT CONTROL

The applicant has provided a draft Stormwater Pollution Prevention Plan (SWPPP) that identifies erosion/sedimentation and stormwater Best Management Practices (BMPs). The SWPPP does not provide conceptual drawings that identify BMPs.

The AFC and draft SWPPP identify a number of potential BMPs for the construction and operation of Unit 7 and associated linear facilities (SECAL 2000a, SECAL 2000b, Mirant 2001c):

- Temporary and permanent vegetation strategies.
- Utilize soil stabilizers (i.e. water) as appropriate to minimize dust.
- The use of geotextiles and mats to stabilize slopes.
- Storm drain inlet protection to prevent sediment-laden runoff from entering inlets or catch basins.
- Utilize silt fence or straw bale barriers to intercept sediment-laden runoff from disturbed soil.
- Secondary containment for hazardous material delivery and storage areas to prevent spills or leakage of liquid materials from contaminating soil or soaking into the ground.
- Designated storage areas for construction wastes, hazardous materials, paints, and related products along with covered dumpsters and containers for waste and recyclables.
- Training of employees on stormwater quality management.
- Implementation of a spill prevention and control plan.
- Timely removal of construction wastes.
- Storage of all liquid wastes in covered containers.
- Emergency spill containment kits and materials in areas of potential hazardous materials release.

- Routine maintenance of the oil/water separator system.
- Management of contaminated excavated materials via a Site Mitigation and Implementation Plan (SMIP).
- Covering soil stockpiles for protection during a rainfall event.
- Cofferdams and silt curtains to be utilized during dredging events.
- Maintenance of intake and outfall structures conducted in accordance with the U.S. Army Corps of Engineers dredging permit.

STAFF'S PROPOSED MITIGATION

In addition to the applicant's proposed mitigation measures, staff recommends the following mitigation measures be required for the Potrero PP Unit 7 project:

WASTEWATER DISCHARGE

The applicant will need to satisfy the requirements that pertain to an Industrial Wastewater Discharge Permit from the San Francisco Public Utilities Commission Bureau of Environmental Regulation and Management (BERM). An application, drawings showing locations of discharge, information on wastewater treatment, and a schematic overview of the facility that will generate the wastewater will need to be submitted.

ALTERNATIVE INTAKE DESIGNS

The Clean Water Act (CWA) Section 316 (b) requires that the "...location, design, construction and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact". The administering agency for this requirement is the SFRWQCB, which has been delegated the authority by the U.S. Environmental Protection Agency.

The new intake structure for Unit 7 and Unit 3 will consist of a bar screen, racks (across an approximately 177 feet long opening) to collect major debris, an intake chamber prior to a series of inclined traveling screens and two 50% circulating water pumps for Unit 3 and two 50% circulating water pumps for Unit 7. The screen openings will be 5/32 inch with an approach velocity of 0.4 feet per second (fps) for water approaching the screens. The screens are rotated while being washed, emptying materials collected into a sluiceway or discharge pipe that will return any material washed from the screens back to the Bay (SECAL 2000a).

Staff must also consider alternatives as directed by California Environmental Quality Act and the Warren – Alquist Act. Alternative intake designs and cooling water technologies (see the **Biological Resources** section of this PSA for further discussion of alternatives) that could be considered include:

1. Off-shore intake locations.
2. Closed cooling water systems.
3. Physical barriers.
4. Fish collection systems.
5. Diversion systems.
6. Operational and flow-reduction alternatives.

OFFSHORE SYSTEMS

Offshore locations would require the construction of large diameter pipe structures extending into the San Francisco Bay. The applicant concluded that because of the massive engineered structures required to support the weight force of water being withdrawn that this concept was infeasible. Staff disagrees with this conclusion on the basis that offshore intake designs are commonly in use and would not necessarily require any more complex structural design than the proposed discharge system. However, it is not obvious that such a design would offer any significant advantages over the intake design proposed by the applicant.

CLOSED-CYCLE COOLING WATER SYSTEMS

In SWRCB Policy 75-58 it is stated that ocean water is preferred over that of freshwater for power plant cooling. SWRCB Policy 75-58 states "...studies associated with power plants should include an analysis of the cost and water use associated with the use of alternative cooling facilities employing dry, or wet/dry modes of operation."

The heat rejection mechanism in wet cooling towers is primarily the evaporation of water to the atmosphere, dry cooling towers transfer heat convectively through heat exchangers, while wet/dry hybrid cooling towers use combinations of the two mechanisms to reject heat to the atmosphere. Cooling towers use forced or induced draft fans to move ambient air through the tower. The ambient air temperature, humidity, velocity, and mass flow rate affect the heat transfer rate and, ultimately, the efficiency of the cooling tower. The cooling tower heat rejection efficiency and pump and fan loading affect the overall power plant thermal efficiency and output.

The fundamental differences between wet, wet/dry hybrid, and dry cooling towers are initial capital costs and heat rejection effectiveness. Dry cooling towers are two to three times more expensive than a wet system. Hybrid systems fall in the range between the two, depending upon the ratio of "wet to dry" cooling in the hybrid design. In general, the cost differences are due to the dry condenser, or heat exchanger, and taller and larger structures for dry and hybrid cooling systems. Despite the significant cost differences, dry and hybrid cooling systems are occasionally employed because they use less water and reduce the occurrence of visible plumes compared to wet systems. For wet/dry hybrid systems, the reduction in water use is dependent upon the percentage of dry versus wet.

Dry and hybrid cooling systems are, however, less efficient in rejecting heat, and generally have higher parasitic (fan) electrical loads and can create a higher pressure (temperature) in the steam turbine condenser. Both of these factors decrease the thermal efficiency and power output of the project. The effects are not as significant on a combined cycle project as compared to a steam-cycle only project, in that the cooling system only affects the steam side of the combined cycle project and not the performance of the gas turbine. The effect would be greater at higher ambient temperatures because the relationship is non-linear. Additional fuel can be burned to overcome some or all of the loss of output, but the fuel will be an additional operating cost and will produce additional air pollutant emissions. Other

characteristics include, for example, higher noise impacts for dry or hybrid cooling systems relative to a wet system due to larger fans to move more ambient air through the tower.

PHYSICAL BARRIERS

Physical barriers principally are designed to block the passage of fish from entering the intake, usually in combination with low velocity.

Traveling Screens

Traveling screens have historically been used to block the intrusion of debris and fish from entering the cooling water systems of power generating facilities. More recently designs have included various fish handling and operational features to reduce the impingement of fish. Vertical traveling screens equipped with fish lifting buckets will be addressed under Fish Collection, Removal, and Conveyance.

Drum type and Wedge-wire screens have been tested and found to have design problems that resulted in blockages, seals, and lack of bypasses. There have also been problems with the lack accessibility to control biofouling of the interior surfaces by mussels, barnacles, and other organisms.

Inclined traveling screens, as proposed by the applicant, have the potential to be an effective deterrent to impingement of fish when combined with the low approach velocity and a shallow angle with relationship to the flow. However, this is dependent upon the angle of the screen along with the slot size of the wedge screen proposed. The applicant has indicated that a more detailed evaluation will be undertaken. Staff proposes that this evaluation along with information on the effectiveness of the specific proposed design be provided prior to the FSA.

Barrier Nets and Meshes

Barrier nets have the ability to exclude fish from water intakes by blocking the entrance to the intake structure. Problems with this type of technology include blockage due to debris, clogging, biofouling, labor intensiveness, and the potential to interfere with navigation in the area. A newer technology of this general type is the Gunderboom water permeable fabric curtain that has shown promise in some applications. The mesh size and surface area of the net must be properly sized to block the fish passage but not cause the fish to become gilled in the net.

FISH COLLECTION, REMOVAL, AND CONVEYANCE SYSTEMS

Fish collection technologies have been developed that either actively or passively collect fish for transport back to the source of the cooling water through a return system.

Modified Traveling Screens

Modifications have been incorporated into traveling screens to reduce the mortality of fish and organisms. These modifications incorporate the addition of water filled buckets that collect the fish, and with the aid of low-pressure washes, transports them into a sluice trough. The fish are then transported back to a safe release

location. This system, used in conjunction with continuous rotation of the screens, may be a viable alternative for fish protection.

Fine-Mesh Screens

Fine-mesh screens with openings as small as 0.5 mm have been used in conjunction with traveling screens. The concept of using the fine mesh screens is that they will collect not only fish but also fish eggs and larvae. However, for some species, impingement on the fine mesh screens can actually result in higher mortality than if the organisms were allowed to pass completely through the circulating water system. Therefore, it cannot be concluded that the use of fine mesh screens would enhance the prevention of impingement of early sea life forms.

FISH RETURN CONVEYANCE SYSTEMS

Fish return and conveyance systems may take the form of fish pumps or a gravity sluice system. New designs of fish pumps have demonstrated the ability to transfer fish with little or no mortality when coupled with fish bypass systems such as angled screens and louvers (EPRI 1999).

DIVERSION SYSTEMS

Fish diversion systems redirect the fish away from the impingement area to a return system or safe area for return to the ambient water source. Designs of such systems include angled screens, modular inclined screens, and louvers.

Angled Screens

Traveling screens are set at an angle to the flow of the water (about 25°) in either a “V” or slant configuration. At the apex of the angle are fish bypass slots that collect the fish that are then pumped or sluiced back to the cooling water source.

Modular Inclined Screens

The modular inclined screen consists of an inclined screen installed after the trash racks at a shallow vertical angle of 10-20° to the flow. Fish are directed to a transport pipe for return to the seawater source.

Louvers

A louver system consists of an array of evenly spaced, vertical slats aligned across a channel at a specified angle, which leads to a bypass.

Results of testing of diversion systems have shown promise with reasonably high efficiencies. However, the results are highly dependent on swimming capabilities, behavioral tendencies, life stages, and specific site characteristics of the local species.

INTAKE MAINTENANCE AND OPERATIONAL MODIFICATIONS

To reduce flow velocities through the intake structure, dredging to control sediment build up that would block cross-sectional area is an appropriate measure to be used. Additionally, reduction of circulating water pump operation during periods of

reduced electrical loads is also considered a viable proposal with an associated energy savings by reducing auxiliary load requirements. This may be accomplished by the shutting down of one of the circulating water pumps when the plant is operating below 50% capacity or making use of variable speed drives on the pumps that will operate in conjunction with the load of the plant.

SOIL CONTAMINATION

Because the proposed Unit 7 project entails the excavation of over 50 cubic yards of contaminated soil bayward of the historic shoreline, a Site Mitigation and Implementation Plan (SMIP) must be developed. This requirement is a result of Article 22A of the City and County of San Francisco's Public Health Code. The SMIP provides descriptions of site conditions, onsite environmental investigations, approximate amounts of soil and groundwater volumes generated during construction, excavation and material handling procedures, and additional sampling methods for soil and groundwater (SECAL 2000a). If encountered contamination exceeds regulatory thresholds, a contaminant mitigation plan will need to be submitted to an appropriate regulatory agency for review and approval prior to the issuance of any building permits (SECAL 2001a).

Recently, the SFRWQCB and Department of Toxic Substance Control (DTSC) have received and reviewed documents that pertain to offshore sediment contamination. The Potrero PP project includes proposed dredging sediment, and therefore needs to characterize its physical, chemical, and biological properties. Staff of the SFRWQCB and DTSC had the following concerns (RWQCB&DTSC 2001Comm):

- DTSC and the RWQCB recommend conducting remediation activities as part of construction. The applicant must develop sufficient site characterization and remediation actions for areas where construction may affect contaminated sediments.
- In order to conduct an ecological risk evaluation (ERE) and to evaluate remedial alternatives, the applicant may need to conduct additional sampling to characterize the vertical and lateral extent of sediment containing hazardous substances.
- The applicant must coordinate with the DMMO regarding offshore sampling. The applicant must develop a workplan that identifies sampling procedures.
- Incomplete data was provided in the Draft Initial Findings Report, Offshore Sediment Sampling Potrero Power Plant (September 28, 2000). Staff will continue to evaluate recent data and will provide further comments in the FSA.
- DTSC has concerns regarding the amount of contamination exposed during post construction and about controlling contaminated groundwater from affecting the surface water (Naito, 2001).

EROSION AND SEDIMENTATION CONTROL

The applicant needs to provide Erosion Control and Stormwater Management drawings to accompany the narrative portion of the SWPPP. The applicant must also provide the following amendments and additions for the proposed Unit 7 project:

- Proposed contours should be shown tying in with existing ones. All proposed utilities including stormwater facilities should be shown on the plan's drawings. All erosion and sedimentation control facilities should be displayed on a map. The drawings should contain a complete mapping symbols legend. This legend should identify all existing and proposed features including a limit of construction boundary. The limit of construction boundary should include the project facility, pipeline areas, onsite road systems, stockpile areas and laydown areas. The limit of construction ensures that work is confined to the proposed Unit 7 project in order to protect all surrounding areas.
- The erosion and sedimentation control plan as part of the draft SWPPP must include drawings that depict BMPs for the transmission line installation and any stockpile storage and laydown areas associated with this activity.
- Transmission line excavation within roadways should be limited to an area that can be excavated and backfilled within a day. Exposed soil should be stabilized upon backfilling the open trench. Spoil material should not be located near any stormwater inlets and should be hauled offsite to an approved disposal area.
- Silt fence and sandbags should be used to trap sediment, and not as runoff conveyance facilities. Berms or channels shall be used to intercept sediment-laden runoff and direct it into the proposed retention basin prior to discharge.
- All excavated material from the boring under Islais Creek should be kept away from and out of the waterbody. The soil should be covered with a liner or anchored mulch. Areas disturbed during the process should be stabilized via permanent vegetation upon completion of the process. Proper storage and use measures for the drilling mud are required to be described in the SWPPP.
- A description of all dewatering equipment and a plan for dewatering, in the event groundwater is contacted during excavation activities.
- Stormwater inlet protection during construction.

BCDC will submit its staff recommendations to the Energy Commission subsequent its review of the PSA. BCDC has recently issued the following concerns regarding bay fill and dredging related to the intake/outfall structures (BCDC2001AFC2):

- The applicant must provide a sampling analysis plan to the DMMO for review and approval to dredge. Upon DMMO approval, the applicant would conduct the analysis and submit the results to DMMO. The results would allow DMMO to identify the appropriate disposal site(s) for the dredged material.
- The applicant must provide figures regarding total square footage and volume of Bay fill proposed below Mean High Tide for the intake/outfall structures. BCDC will review this data to determine the mitigation.
- The applicant must provide onsite BMPs that limit accelerated runoff into the Bay (Lacko, 2001).

The City and County of San Francisco (CCSF) submitted the following requests regarding excavation activities that fall under jurisdiction of the Maher Ordinance, which is overseen by the CCSF Department of Public Health (DPH).

- The applicant must verify if the transmission line corridor and electrical switching station are included as part of the Maher Ordinance compliance review and, if so, provide data for these sites to the CCSF DPH.
- The applicant must make revisions to certain previous sample points and provide a workplan that entails locations and methodology for the supplemental analyses.
- The applicant must provide a submittal of pipeline schematics, excavation cross-sections, and sampling for the percentage of asbestos in the bedrock.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

The existing Potrero PP discharges cooling water to San Francisco Bay under NPDES Permit CA0005657, which has recently been extended to May 18, 2004. A new NPDES permit will be required for the Unit 7 thermal discharge, as well as the updated Unit 3 thermal discharge. The new permit is expected to contain limits for a number of chemicals. This permit will need to include an exception to the California Thermal Plan, which prohibits discharge temperature rises exceeding 4°F for new discharges in enclosed bays.

Mirant filed for an NPDES permit on May 17, 2001 for these thermal discharges. It is anticipated that this permit would cover stormwater as well as other miscellaneous service water components. By regulation, the Regional Water Quality Control Board has 180 days to issue a permit after filing. Without a final NPDES permit, staff is unable at this time to determine that the project will comply with all applicable laws, ordinances and standards.

The proposed thermal discharge will not meet the California Thermal Plan requirement that the discharge temperature be less than 4°F above the natural temperature of the receiving water. Given the relatively swift currents past the site, and the fact that the proposed discharge will provide better dilution than the current discharge, staff concludes that a waiver of this requirement is warranted, provided biological impacts are found to be acceptable. Nevertheless, the thermal plume should be kept to a minimum and it is recommended that the following Thermal Plan requirements for an open ocean be adopted:

The discharge of elevated temperature wastes shall not result in increases in the natural water temperature exceeding 4° F at (a) the shoreline, (b) the surface of any ocean substrate, or (c) the ocean surface beyond 1,000 feet from the discharge system. The surface temperature limitation shall be maintained at least 50 percent of the duration of any complete tidal cycle.

Because the proposed Unit 7 will involve dredging activities for the installation of the intake and outfall structure, the applicant will need to obtain a permit from the

Dredged Material Management Office. Brian Wirtz (2001), a representative the Army Corps of Engineers, stated that the applicant has not yet submitted an application for the Dredge Material Reuse/Disposal Permit.

CONCLUSIONS AND RECOMMENDATIONS

The information identified below must be provided prior to the PSA workshops in order to be discussed in detail. Otherwise, the FSA will be delayed.

THERMAL IMPACTS

At this time, insufficient details are provided to allow an evaluation of the diffusers performance relative to the California Thermal Plan. The required information includes a) details of the diffuser design (port number, spacing, diameter and orientation) and b) a characterization of the thermal plume in terms of plots of temperature rise isotherms at different times in the tide cycle. The applicant must provide this information for staff to evaluate prior to the FSA.

BEST TECHNOLOGY AVAILABLE – COOLING WATER INTAKE

The addition of Unit 7 may have significant water supply impacts unless proper mitigation is performed regarding the design of the circulating water intake structure. Therefore, until the applicant has performed a complete evaluation of alternative designs for the intake, staff can not make conclusions or recommendations related to the impacts of the circulating water system. This evaluation is necessary before completion of the FSA.

WATER SUPPLY/WASTEWATER DISCHARGE

The applicant filed for and NPDES permit on May 17, 2001. Without a final NPDES permit, staff is unable to determine that the project will comply with all applicable laws, ordinances, regulations and standards. Staff will also continue to evaluate the use of wastewater effluent for the Unit 7 project between now and the FSA.

EROSION AND SEDIMENTATION / STORMWATER

Staff cannot make a determination that the proposed Unit 7 project will not result in any significant adverse impacts to soil resources until the following items are addressed:

- The development of a complete erosion and sedimentation control plan that incorporates the Staff's Proposed Mitigation Measures.
- An updated Spill Prevention Control and Countermeasure Plan.
- A NPDES permit for Stormwater Discharges Associated with Construction Activities.
- Sizes, lengths, and locations (including tie-in) for proposed potable water pipelines.

OFFSHORE DREDGING

in order to be found in compliance, the applicant must provide a revised offshore sediment analysis report. This analysis will be reviewed by the DMMO for further comment. The applicant needs to address concerns raised by the RWQCB, DTSC, and BCDC including, but not limited to, additional site characterization, remediation activities, and coordination between the applicant and the agencies.

CONDITIONS OF CERTIFICATION

SOILS & WATER 1: Prior to site mobilization for the proposed project and any ground disturbance activities associated with construction of any project linear element, the project owner shall obtain Energy Commission staff approval for a Storm Water Pollution Prevention Plan (SWPPP) as required under the General Stormwater Construction Activity Permit for the project.

Verification: Thirty days prior to the start of any site mobilization activities associated with the construction of the project and/or ground disturbing activities associated with construction of any project linear element, the project owner will submit a copy of the Storm Water Pollution Prevention Plan (SWPPP) to the Energy Commission Compliance Project Manager (CPM) for review and approval. Approval of the plan by the Energy Commission CPM must be received prior to the initiation of any site mobilization activities associated with construction of any project element.

SOILS & WATER 2: Prior to beginning any site mobilization activities associated with construction of the project and/or ground disturbance activities associated with construction of any project linear element, the project owner shall obtain Energy Commission staff approval for a final erosion control and revegetation plan that addresses all project elements. The final plan to be submitted for Energy Commission's approval shall contain all the elements of the draft plan with changes made to address any staff comments and the final design of the project.

Verification: The erosion control and revegetation plan shall be submitted to the Energy Commission CPM no later than thirty days prior to site mobilization and/or ground disturbance associated with construction of linear facilities. Approval of the final plan by the Energy Commission CPM must be received prior to the initiation of site mobilization activities associated with construction of any project element.

SOIL & WATER 3: Prior to site mobilization, the project owner shall obtain from the San Francisco Bay Regional Water Quality Control Board (RWQCB) a revised National Pollutant Discharge Elimination System (NPDES) permit that incorporates the proposed Potrero Unit 7. The project owner shall comply with all provisions of the revised NPDES permit. The project owner shall notify the Energy Commission CPM of any proposed changes to this permit, including any application for permit renewal.

Verification: Thirty (30) days prior to site mobilization, the project owner shall submit to the Energy Commission CPM a copy of the NPDES permit.

SOIL & WATER 4: The project owner shall obtain approval from the Dredged Material Management Office (DMMO) for a Dredge Material Reuse/Disposal Permit for the proposed Unit 7 project prior to site mobilization. The project owner shall comply with all provisions of the permit. The project owner shall notify the Energy Commission CPM of any proposed changes to this permit.

Verification: At least sixty (60) days prior to site mobilization, the project owner shall submit to the Energy Commission CPM a copy of the Dredge Material Reuse/Disposal Permit.

SOIL & WATER 5: The project owner shall prepare a revised Site Mitigation and Implementation Plan. This plan shall detail the proposed means of disposal of dewatering groundwater, BMPs designed to handle waterborne contaminants and incorporate any comments provided by federal, state, and local agencies.

Verification: Thirty (30) days prior to site mobilization, the project owner shall submit to the Energy Commission CPM a copy of the revised Site Mitigation and Implementation Plan for approval.

SOIL & WATER 6: The project owner shall submit to the Energy Commission CPM and the Dredged Material Management Office (DMMO) an Ecological Risk Evaluation and Remedial Action Plan.

Verification: At least 60 days prior to site mobilization, the project owner shall submit to both the Energy Commission CPM and DMMO a copy of the Ecological Risk Evaluation and Remedial Action Plan.

SOIL&WATER 7: Prior to any directional boring activities, the project owner/applicant will submit a Frac-Out Contingency Plan (FCP) for staff approval. The plan must include specifications for pre-monitoring in order to determine if the proposed route will cause any adverse impacts during the boring. The plan must provide for remediation in case a frac-out occurs. The plan must include an extensive monitoring program to be implemented during the boring operations. Other aspects of the plan need to address contacting all agencies that have jurisdiction of Islais Creek to inform them of the proposed boring operation. An agency contact list must be developed and kept onsite. These agencies should be contacted in the event of a frac-out.

Verification: Thirty (30) days prior to the direct boring project, the project owner needs to submit an FCP to the CPM for review. Construction activities may not commence until the plan has been deemed adequate by the CPM.

SOIL & WATER 8: The project owner shall have an environmental professional (as defined by the American Society for Testing and Materials practice E 1527-97 Standard Practice for Phase I Environmental Site Assessments) available for consultation during excavation activities. If potentially

contaminated groundwater is encountered during excavation at the proposed site as evidenced by discoloration, odor, or other signs, prior to any further construction activity at that location, the environmental professional shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner and the Energy Commission CPM stating the recommended course of action. If, in the opinion of the environmental professional, significant remediation may be required, the project owner shall contact representatives of the San Francisco Bay Regional Water Quality Control Board for guidance and possible oversight. The project owner shall also provide a work plan with details and procedures to be implemented should contaminated soils and/or groundwater be encountered. This work plan will identify how the project owner will address any adverse impacts and the mitigation measures to be used to render them less than significant.

Verification: At least 60 days prior to the start of construction the project owner shall provide the Energy Commission CPM with a work plan which details the procedures that will be used should any contaminated soils and/or groundwater be encountered during construction. Should contaminated sediments and groundwater be identified, the project owner should notify the CPM in writing within 5 days of any reports filed by the environmental professional, and indicate if any contamination has been determined to be present.

REFERENCES

- BCDC (San Francisco Bay Conservation and Development Commission).
BCDC2001AFC2, comments on the Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission, May 2, 2001; docketed May 21, 2001.
- CDM (Camp Dresser & McKee), 1997. Phase I Environmental Site Assessment, Potrero Power Plant, City and County of San Francisco, California. Prepared for Pacific Gas and Electric Company.
- CEC (California Energy Commission). CEC2000DReq1. California Energy Commission (CEC) staff Data Requests, Set 1, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to Southern Energy California, November 7, 2000.
- CRWQCB. 1995. Water Quality Control Plan. California Regional Water Quality Control Board, San Francisco Bay Region.
- EPRI Report, Fish Protection at Cooling Water Intakes, December 1999.
- EPRI Report, Technical Evaluation of the Utility of Intake Approach Velocity as an Indicator of Potential Adverse Environmental Impact under Clean Water Act Section 316(b), December 2000.

Geomatrix (Geomatrix Consultants Inc.) 2000. Additional Site Characterization, Potrero Power Plant Site, 1201 Illinois Street, San Francisco, California.

Hollis, Pam. City and County of San Francisco Department of Public Health. March 28, 2001. Personal communication with Pam Hollis about DPH concerns.

MIRANT (Mirant Corp.). MIRANT2001c. Supplemental Information to the Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Addresses 1) Soil & Water Resources Supplemental Information; 2) [Draft] Stormwater Pollution Prevention Plan (SWPPP); and 3) Calculations of 100-Year, 24-Hour Storm Runoff and Full-Pipe Capacity. Submitted to the California Energy Commission, May 1, 2001.

MIRANT (Mirant Corp.). MIRANT2001d. Supplemental Information to the Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Addresses 1) Intake and Discharge Structural Modifications; and 2) Figures I and II. Submitted to the California Energy Commission, May 2, 2001.

MIRANT (Mirant Corp.). MIRANT2001DrespSAEJ1. Mirant's response to Southeast Alliance for Environmental Justice (SAEJ) Data Requests, Set 1, Nos. 1 through 155, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission February 27, 2001.

MIRANT (Mirant Corp.). MIRANT2001e. Supplemental Information to the Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Addresses Construction Methods – Cooling Water Intake and Discharge Structures. Submitted to the California Energy Commission, May 7, 2001.

MIRANT (Mirant Corporation). Mirant2001DRespCBE. Mirant responses to Communities for a Better Environment, Data Requests, Set 1, Nos. 1 - 113, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission April 25, 2001.

MIRANT (Mirant Corporation). Mirant2001DRespSAEJ2. Mirant responses to Southeast Alliance for Environmental Justice, Data Requests, Set 2, Nos. 156 - 209 Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission May 14, 2001.

Naito, Janet. Department of Toxic Substances Control (DTSC). April 5, 2001. Personal communication with Janet Naito regarding excavation of contaminated soil.

PG&E (Pacific Gas and Electric Company), 1991. Hunters Point and Potrero Power Plants: Thermal Effects Assessment, 1989-1990. Tenera Environmental Services, Berkeley, CA.

San Francisco Bay Conservation and Development Commission. April 4, 2001. Personal communication with Leslie Lacko about onshore and offshore construction activities.

San Francisco Bay Regional Water Quality Control Board. May 2001. Personal communication with Judy Huang regarding the status of NPDES permit.

San Francisco General Plan. April 1997. City and County of San Francisco General Plan.

San Francisco Public Utilities Commission Bureau of Environmental Regulation and Management (BERM). February 6, 2001. Personal communication with Bruce Seale about Industrial Waste Ordinance.

SECAL (Southern Energy California). 2000a. Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, May 31, 2000.

SECAL (Southern Energy California). 2000b. Supplemental Information in Response to CEC Data Adequacy Request, Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, August 31, 2000.

SECAL (Southern Energy California). 2001a. Amendment to the Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Addresses the demolition of six existing structures. Submitted to the California Energy Commission, January 19, 2001.

SECAL (Southern Energy California). SECAL2000Seds1. Draft Initial Findings Report, Offshore Sediment Sampling, Potrero Power Plant, September 28, 2000. Submitted to the California Energy Commission, October 20, 2000.

SECAL (Southern Energy California). SEP2000DResp1. Southern Energy California response to staff Data Requests, Set 1, Nos. 1 through 139, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission on December 7, 2000.

SECAL (Southern Energy California). SEP2001DRes3. Southern Energy California response to staff Data Requests, Set 3, Nos. 162 through 169, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission January 29, 2001.

SFBRWQCB (San Francisco Bay Regional Water Quality Control Board) and DTSC (Department of Toxic Substances Control). RWQCB&DTSC 2001Comm. Comments on the Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission, May, 2001.

Southern California Edison (SCE), San Onofre Nuclear Generating Station Fish Behavioral Study, September 22, 2000.

Wirtz, Brian. United States Army Corps of Engineers, San Francisco Division. May 14, 2001. Personal communication with Brian Wirtz about regarding Section 10 and 404 issues with regards to the status of the DMMO.

WORKER SAFETY AND FIRE PROTECTION

Alvin J. Greenberg, Ph.D. and Rick Tyler

INTRODUCTION

Worker safety and fire protection is legislated by laws, ordinances, regulations, and standards (LORS), and enforced through regulations codified at the Federal, State, and local levels. Worker safety is of utmost priority at the project location and is documented through worker safety practices and training. Industrial workers at the facility operate process equipment and handle hazardous materials daily and may face hazards that can result in accidents and serious injury. Protection measures are employed to either eliminate these hazards or minimize the risk through special training, protective equipment or procedural controls.

The purpose of this analysis is to assess the worker safety and fire protection measures proposed by the Potrero Power Plant Unit 7 Project (Unit 7) and to determine whether the applicant has proposed adequate measures to:

- comply with applicable safety LORS;
- protect the workers during construction and operation of the facility;
- protect against fire; and
- provide adequate emergency response procedures.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

In December 1970 Congress enacted Public Law 91-596, the Federal Occupational Safety and Health Act of 1970. This Act mandates safety requirements in the workplace and is found in Title 29 of the United States Code, § 651 (29 U.S.C. §§ 651 through 678). Implementing regulations are codified at Title 29 of the Code of Federal Regulations, under General Industry Standards §§ 1910.1 - 1910.1500 and clearly define the procedures for promulgating regulations and conducting inspections to implement and enforce safety and health procedures to protect workers, particularly in the industrial sector. Most of the general industry safety and health standards now in force under this OSH Act represent a compilation of materials from existing federal standards and national consensus standards. These include standards from the voluntary membership organizations of the American National Standards Institute (ANSI) and the National Fire Protection Association (NFPA) which publishes the National Fire Codes.

The purpose of the Occupational Safety and Health Act is to “assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources,” (29 USC § 651). The Federal Department of Labor promulgates and enforces safety and health standards that are applicable to all businesses affecting interstate commerce. The Department of

Labor established the Occupational Safety and Health Administration (OSHA) in 1971 to discharge the responsibilities assigned by the OSH Act.

Applicable Federal requirements include:

- 29 U.S. Code § 651 et seq. (Occupational Safety and Health Act of 1970);
- 29 CFR §1910.1 - 1910.1500 (Occupational Safety and Health Administration Safety and Health Regulations);
- 29 CFR §1952.170 – 1952.175 (Federal approval of California's plan for enforcement of its own Safety and Health requirements, in lieu of most of the Federal requirements found in 29 CFR §1910.1 – 1910.1500).

STATE

California passed the Occupational Safety and Health Act of 1973 ("Cal/OSHA") as published in the California Labor Code § 6300. Regulations promulgated as a result of the Act are codified at Title 8 of the California Code of Regulations, beginning with §337-560 and continuing with §1514 through 8568. The California Labor Code requires that the Cal/OSHA Standards Board adopt standards at least as effective as the federal standards (Labor Code § 142.3(a)) and thus all Cal/OSHA health and safety standards meet or exceed the Federal requirements. Hence, California obtained federal approval of its State health and safety regulations, in lieu of the federal requirements published at 29 CFR §1910.1 - 1910.1500). The Federal Secretary of Labor, however, continually oversees California's program and will enforce any federal standard for which the State has not adopted a Cal/OSHA counterpart.

The State of California Department of Industrial Relations is charged with responsibility for administering the Cal/OSHA plan. The Department of Industrial Relations is further split into six divisions to oversee, among other activities: industrial accidents, occupational safety and health, labor standards enforcement, statistics and research, and the State Compensation Insurance Fund (workers compensation).

Employers are responsible for informing their employees about workplace hazards, potential exposure and the work environment (Labor Code § 6408). Cal/OSHA's principal tool in ensuring that workers and the public are informed is the Hazard Communication standard first adopted in 1981 (8 CCR §5194). This regulation was promulgated in response to California's Hazardous Substances Information and Training Act of 1980. It was later revised to mirror the Federal Hazard Communication Standard (29 CFR §1910.1200) which established on the federal level an employee's "right to know" about chemical hazards in the workplace, but added the provision of applicability to public sector employers. A major component of this regulation is the required provision of Material Safety Data Sheets (MSDSs) to workers. MSDSs provide information on the identity, toxicity, and precautions to take when using or handling hazardous materials in the workplace.

Finally, 8 CCR §3203 requires that employers establish and maintain a written Injury and Illness Prevent Program to identify workplace hazards and communicate them to its employees through a formal employee-training program.

Applicable State requirements include:

- 8 CCR §339 - List of hazardous chemicals relating to the Hazardous Substance Information and Training Act;
- 8 CCR §337, et seq. Cal/OSHA regulations;
- 24 CCR § 3, et seq. - incorporates the current addition of the Uniform Building Code;
- Health and Safety Code § 25500, et seq. - Risk Management Plan requirements for threshold quantity of listed acutely hazardous materials at the facility;
- Health and Safety Code § 25500 - 25541 - Hazardous Material Business Plan detailing emergency response plans for hazardous materials emergency at the facility.

LOCAL

The California Building Standards Code published at Title 24 of the California Code of Regulations § 3 et seq is comprised of eleven parts containing the building design and construction requirements relating to fire and life safety and structural safety. The Building Standards Code includes the electrical, mechanical, energy, and fire codes applicable to the project. Local planning/building & safety departments enforce the California Uniform Building Code.

National Fire Protection Association (NFPA) standards are published in the California Fire Code. The fire code contains general provisions for fire safety, including but not restricted to: 1) required road and building access; 2) water supplies; 3) installation of fire protection and life safety systems; 4) fire-resistive construction; 5) general fire safety precautions; 6) storage of combustible materials; 7) exits and emergency escapes; and 8) fire alarm systems. The California Fire Code reflects the body of regulations published at Part 9 of Title 24 (H&S Code §18901 et seq.) pertaining to the California Fire Code.

Similarly, the Uniform Fire Code (UFC) Standards, a companion publication to the California Fire Code, contains standards of the American Society for Testing and Materials and the NFPA. It is the United State's premier model fire code. It is updated annually as a supplement and published every third year by the International Fire Code Institute to include all approved code changes in a new edition. The San Francisco Fire Code consists primarily of the 1997 Edition of the Uniform Fire Code. The San Francisco Fire Code was adopted by Ordinance 141-99, File Number 990716. It was approved on November 5, 1999 with an effective date of July 1, 1999. The Fire Code was last amended by Ordinance 322-00, File Number 001917. It was approved on December 28, 2000, with an effective date of July 16, 2000.

Applicable local (or locally enforced) requirements include:

- 1998 Edition of California Fire Code and all applicable NFPA standards (24 CCR Part 9);
- California Building Code Title 24, California Code of Regulations (24 CCR § 3, et seq.).

- Uniform Fire Code, 1997

SETTING

The Potrero Power Plant Unit 7 site is located in the southwest portion of the existing Potrero Power Plant in the City and County of San Francisco. The proposed project will be situated wholly within the confines of an existing and active power generating facility and as such, fire protection systems and worker safety programs already exist and are in place. Current land uses in the site vicinity include mostly industrial with some commercial uses. Fire support services to the site will be under the jurisdiction of the San Francisco Fire Department (SFFD). SFFD Station 25 is located approximately 0.9 miles south of the facility at the corner of 3rd and Cargo Streets. This is the closest station to the site and is assigned as the off-site first responder to the Unit 7 project. Response time is estimated to be approximately 3-4 minutes (SFFD 2001).

Station 25 does not have HAZMAT capabilities. SFFD Station 36, located at 109 Oak Street, is the assigned hazmat first responder. Response time for Station 36 is estimated to be 6-7 minutes. Station 36 has 24-hour hazmat capabilities, a hazmat engine and four hazmat personnel. In a hazmat situation, both Station 25 and Station 36 are dispatched (SFFD 2001).

IMPACTS

WORKER SAFETY

Industrial environments are potentially dangerous, during both construction and operation of facilities. Workers at the proposed project will be exposed to loud noises, moving equipment, trenches, and confined space entry and egress problems. The workers may experience falls, trips, burns, lacerations, and numerous other injuries. They have the potential to be exposed to falling equipment or structures, chemical spills, hazardous waste, fires, explosions, and electrical sparks and electrocution. It is important for the Unit 7 project to have well-defined policies and procedures, training, and hazard recognition and control at their facility to minimize such hazards and protect workers. If the facility complies with all LORS, workers will be adequately protected from health and safety hazards.

FIRE HAZARDS

During construction and operation of the proposed Unit 7 project, there will be the potential for both small fires and major structural fires. Electrical sparks, combustion of fuel oil, natural gas or flammable liquids, explosions, and over-heated equipment, may cause small fires. Major structural fires may develop from uncontrolled fires or be caused by large explosions of natural gas or other flammable gasses or liquids. Compliance with all LORS will be adequate to assure protection from all fire hazards.

CUMULATIVE IMPACTS

Staff reviewed the potential for the construction and operation of the proposed Unit 7 project, combined with existing industrial facilities, to result in impacts on the fire and emergency service capabilities of the San Francisco Fire Department and found that cumulative impacts were insignificant.

APPLICANT'S PROPOSED MITIGATION

WORKER SAFETY

A Safety and Health Program will be prepared by the applicant to minimize worker hazards during construction and operation. Staff uses the phrase "Safety and Health Program" to refer to the measures that will be taken to ensure compliance with the applicable LORS during the construction and operational phases of the project.

CONSTRUCTION SAFETY AND HEALTH PROGRAM

The Unit 7 project encompasses construction and operation of a 540-MW electric power generating unit and supporting infrastructure. Workers will be exposed to hazards typical of construction and operation of a gas-fired combined cycle facility. Remediation of contamination present within the area of construction will be performed during the initial construction phase of Unit 7.

Construction Safety Orders are published at 8 CCR § 1502, et seq. These requirements are promulgated by Cal/OSHA and are applicable to the construction phase of the project. The Construction Safety and Health Program will include the following:

- Construction Injury and Illness Prevention Program (8 CCR § 1509);
- Construction Fire Protection and Prevention Plan (8 CCR § 1920); and
- Personal Protective Equipment Program (8 CCR §§ 1514 - 1522).
- Hazardous Materials Action Plan

Additional programs under General Industry Safety Orders (8 CCR §§ 3200 - 6184), Electrical Safety Orders (8 CCR §§ 2299 - 2974) and Unfired Pressure Vessel Safety Orders (8 CCR §§ 450 - 544) will include:

- Electrical Safety Program;
- Unfired Pressure Vessel Safety Orders;
- Equipment Safety Program;
- Forklift Operation Program;
- Excavation/Trenching Program;
- Fall Prevention Program;
- Scaffolding/Ladder Safety Program;
- Articulating Boom Platforms Program;
- Crane and Material Handling Program;
- Housekeeping and Material Handling and Storage Program;

- Hot Work Safety Program;
- Respiratory Protection Program;
- Employee Exposure Monitoring Program;
- Confined Space Entry Program;
- Hand and Portable Power Tool Safety Program;
- Hearing Conservation Program;
- Back Injury Prevention Program;
- Hazard Communication Program;
- Air Monitoring Program;
- Heat and Cold Stress Monitoring and Control Program; and
- Pressure Vessel and Pipeline Safety Program.

The AFC includes adequate outlines of each of the above programs. Prior to construction of the Unit 7 project, detailed programs and plans will be provided pursuant to the condition of certification WORKER SAFETY-1.

OPERATIONS AND MAINTENANCE SAFETY AND HEALTH PROGRAM

Upon completion of construction and prior to operations at the Unit 7 project, the Operations and Maintenance Safety and Health Program will be prepared. This operational safety program will include the following programs and plans:

- Injury and Illness Prevention Program (8 CCR § 3203);
- Emergency Action Plan (8 CCR § 3220);
- Hazardous Materials Management Program;
- Operations and Maintenance Safety Program;
- Fire Protection and Prevention Program (8 CCR § 3221); and
- Personal Protective Equipment Program (8 CCR §§ 3401-3411).

In addition, the requirements under General Industry Safety Orders (8 CCR §§ 3200 - 6184), Electrical Safety Orders (8 CCR §§ 2299 - 2974) and Unfired Pressure Vessel Safety Orders (8 CCR §§ 450 - 544) will be applicable to the project. Written safety programs, which the applicant will develop, for the Unit 7 project will ensure compliance with the above-mentioned requirements.

The AFC includes adequate outlines of the Emergency Action Plan (AFC Table 8.7-3), the Construction Training Program Plan (AFC Table 8.7-4), and the Operations and Maintenance Training Program Plan (AFC Table 8.7-5). Prior to operation of the Unit 7 project, all detailed programs and plans will be provided pursuant to condition of certification WORKER SAFETY-2.

SAFETY AND HEALTH PROGRAM ELEMENTS

The applicant provided the proposed outlines for both a Construction Safety and Health Program and an Operation Safety and Health Program. The measures in these plans are derived from applicable sections of state and federal law. The major items required in both Safety and Health Programs are as follows:

INJURY AND ILLNESS PREVENTION PROGRAM (IIPP)

The applicant will submit an expanded Construction and Operations Illness and Injury Prevention Program to Cal/OSHA for review and comment 30 days prior to both construction and operation of the project.

The IIPP will include the following components as presented in the AFC:

- Identity of person(s) with authority and responsibility for implementing the program;
- System ensuring employees comply with safe and healthy work practices;
- System facilitating employer-employee communications;
- Procedures identifying and evaluating workplace hazards, including inspections to identify hazards and unsafe conditions;
- Methods for correcting unhealthy/unsafe conditions in a timely manner;
- Methods of documenting inspections and training and for maintaining records; and
- A training program for:
 - introducing the program;
 - new, transferred, or promoted employees;
 - new processes and equipment;
 - supervisors;
 - contractors.

EMERGENCY ACTION PLAN

California regulations require an Emergency Action Plan (8 CCR § 3220). The AFC contains a satisfactory outline for an emergency action plan (Table 8.7-3).

The outline lists the following features:

- Purpose and Scope of Emergency Action Plan;
- Personnel Responsibilities during Emergencies;
- Specific Response Procedures;
- Evacuation Plan;
- Emergency Equipment Locations;
- Fire Extinguisher Locations;
- Site Security;
- Accident Reporting and Investigation;
- Lockout/Tagout;
- Hazard Communication;
- Spill Containment and Reporting;
- First Aid and Medical Response;
- Respiratory Protection;
- Personal Protective Equipment;
- Sanitation; and
- Work Site Inspections.

FIRE PREVENTION PLAN

California Code of Regulations requires an Operations Fire Prevention Plan (8 CCR § 3221). The AFC describes a proposed fire prevention plan which is acceptable to staff. The plan will include the following topics:

Responsibilities;

- Procedures for fire control;
- Fixed and Portable fire-fighting equipment;
- Housekeeping;
- Employee alarm/communication practices;
- Servicing and refueling areas;
- Training; and
- Flammable and combustible liquid storage.

Staff proposes that the Applicant submit a final Fire Protection and Prevention Plan to the Energy Commission Compliance Project Manager (CPM) and the San Francisco Fire Department for review and approval to satisfy proposed conditions of certification WORKER SAFETY 1 and 2.

PERSONAL PROTECTIVE EQUIPMENT PROGRAM

California regulations require Personal Protective Equipment (PPE) and first aid supplies whenever hazards are encountered which, due to process, environment, chemicals or mechanical irritants can cause injury or impair bodily function as a result of absorption, inhalation or physical contact (8 CCR § 3380-3400). The Unit 7 project operational environment will likely require PPE.

Information provided in the AFC indicates that all employees required to use PPE will be checked for proper fit and to see if they are medically capable of wearing the equipment. All safety equipment will meet NIOSH or ANSI standards and will carry markings, numbers, or certificates of approval. Respirators will meet NIOSH and California Department of Health and Human Services Standards. Each employee will be provided with the following information pertaining to the protective clothing and equipment:

- Proper use, maintenance, and storage;
- When the protective clothing and equipment are to be used;
- Benefits and limitations; and
- When and how the protective clothing and equipment are to be replaced.

The PPE Program ensures that employers comply with the applicable requirements for PPE and provide employees with the information and training necessary to implement the program.

OPERATIONS AND MAINTENANCE WRITTEN SAFETY PROGRAM

In addition to the specific plans listed above, there are additional LORS applicable to the project, which are called "safe work practices". Both the Construction and the Operations Safety Programs will address safe work practices under a variety of programs. The components of these programs include the following:

- Fall Protection Program;
- Hot Work Safety Program;
- Confined Space Entry;
- Hearing Conservation Program;
- Hazard Communication Program;
- Process Safety Management (PSM) Program; and
- Contractor Safety Program.

OPERATIONS AND MAINTENANCE SAFETY TRAINING PROGRAMS

Employees will be trained in the safe work practices described in the above-reference safety programs.

FIRE PROTECTION

Staff reviewed the information provided in the AFC regarding available fire protection services and equipment (AFC Section 8.7 Worker Safety and Health) to determine if the project would adequately protect workers and if it would affect the fire protection services in the area. The project will rely on both onsite fire protection systems and local fire protection services. The onsite fire protection system provides the first line of defense for small fires. In the event of a major fire, fire support services including trained firefighters and equipment for a sustained response would be required by the San Francisco Fire Department.

The information in the AFC indicates that the project intends to meet the minimum fire protection and suppression requirements. Elements include both fixed and portable fire extinguishing systems. The fire water supply (the San Francisco Bay) and an on-site electric fire-water pumping system (with diesel generator back-up) will provide more than an adequate quantity of fire-fighting water to yard hydrants, hose stations, and water spray and sprinkler systems. The motor driven fire pump will be capable of supplying maximum water demand for any automatic sprinkler system plus water for fire hydrants and hose stations.

A carbon dioxide fire protection system will be provided for the combustion turbine generator (CTG) and accessory equipment. Fire detection sensors will also be installed.

Fire hydrants and hose stations will be placed at approximately 300-foot intervals around the proposed facility as per NFPA 24 guidance.

In addition to the fixed fire protection system, smoke detectors, combustible gas detectors, and portable extinguishers will be located throughout the plant with size, rating, and spacing in accordance with the Uniform Fire Code.

The applicant will be required to provide the final Fire Protection and Prevention Program to staff and to the San Francisco Fire Department, prior to construction and operation of the project, to confirm the adequacy of the proposed fire protection measures.

FACILITY CLOSURE

The project owner/operator is responsible for maintaining an operational fire protection system during closure activities. The project must also stay in compliance with all applicable health and safety LORS during that time. A facility closure plan will be developed at least one year prior to closure to incorporate these requirements, and submitted to the Energy Commission Compliance Project Manager.

CONCLUSION AND RECOMMENDATIONS

CONCLUSIONS

If the applicant for the proposed Unit 7 project provides a Project Construction Injury and Illness Prevention Program and a Project Operations Safety and Health Program as required by conditions of certification **WORKER SAFETY 1 and 2**, staff believes that the project will incorporate sufficient measures to ensure adequate levels of industrial safety, and comply with applicable LORS. Staff also concludes that the proposed plant will not have significant impacts on local fire protection services. The proposed facility is located within an area that is currently served by the local fire department. The fire risks of the proposed facility are similar to those of existing facilities in the immediate vicinity and thus pose no significant added demands on local fire protection services.

RECOMMENDATIONS

If the Commission certifies the project, staff recommends that the Commission adopt the following proposed conditions of certification. The proposed conditions of certification provide assurance that the Construction Injury and Illness Prevention Program and the Operations Safety and Health Program proposed by the applicant will be reviewed by the appropriate agencies before implementation. The conditions also require verification that the proposed plans adequately assure worker safety and fire protection and comply with applicable LORS.

PROPOSED CONDITIONS OF CERTIFICATION

WORKER SAFETY-1 The project owner shall submit to the CPM a copy of the Project Construction Injury and Illness Prevention Program, containing the following:

- A Construction Safety Program;
- A Construction Personal Protective Equipment Program;
- A Construction Exposure Monitoring Program;
- A Construction Emergency Action Plan; and
- A Construction Fire Protection and Prevention Plan.

The Safety Program, the Personal Protective Equipment Program, and the Exposure Monitoring Program shall be submitted to the CPM for review and comment concerning compliance of the program with all applicable Safety Orders. The Construction Fire Protection and Prevention Plan and Emergency Action Plan shall be submitted to the of San Francisco Fire Department for review and comment prior to submittal to the CPM.

Verification: At least 30 days prior to the start of construction, the project owner shall submit to the CPM for review and approval a copy of the Project Construction Injury and Illness Prevention Program. The project owner shall provide a letter from the San Francisco Fire Department stating that they have reviewed and commented on the Construction Fire Protection and Prevention Plan Emergency Action Plan. Comments shall be included in the submittal to the CPM along with details ensuring compliance with any recommended changes.

WORKER SAFETY-2 The project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety and Health Program containing the following:

- an Operation Injury and Illness Prevention Plan;
- an Emergency Action Plan;
- Hazardous Materials Management Program;
- Operations and Maintenance Safety Program;
- Fire Protection and Prevention Program (8 CCR § 3221); and;
- Personal Protective Equipment Program (8 CCR §§ 3401-3411).

The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the Cal/OSHA Consultation Service, for review and comment concerning compliance of the program with all applicable Safety Orders. The Operation Fire Protection Plan and the Emergency Action Plan shall also be submitted to the City of San Francisco Fire Department for review and acceptance.

Verification: At least 30 days prior to the start of operation, the project owner shall submit to the CPM a copy of the final version of the Project Operations and Maintenance Safety & Health Program. It shall incorporate Cal/OSHA Consultation Service's comments, stating that they have reviewed and accepted the specified elements of the proposed Operations and Maintenance Safety and Health Plan.

REFERENCES

1998 California Fire Code. Published by the International Fire Code Institute comprised of the International Conference of Building Officials, the Western Fire Chiefs Association, and the California Building Standards Commission. Whittier, Ca.

1997 Uniform Fire Code, Vol. 1. Published by the International Fire Code Institute comprised of the International Conference of Building Officials and the Western Fire Chiefs Association, Whittier, Ca.

San Francisco Fire Department (SFFD). 2001. Personal communication with Lieutenant Tony Rousso, Station 25. April 10, 2001.

ENGINEERING ASSESSMENT

FACILITY DESIGN

Brian Payne

INTRODUCTION

Facility Design encompasses the civil, structural, mechanical and electrical engineering design of the project. The purpose of the Facility Design analysis is to:

- verify that the laws, ordinances, regulations and standards (LORS) applicable to the design and construction of the project have been identified;
- verify that the project and ancillary facilities have been described in sufficient detail, including proposed design criteria and analysis methods, to provide reasonable assurance that the project can be designed and constructed in accordance with all applicable LORS, and in a manner that protects environmental quality and assures public health and safety;
- determine whether special design features should be considered during final design to deal with conditions unique to the site which could influence public health and safety or environmental protection; and
- describe the design review and construction inspection process and establish Conditions of Certification that will be used to monitor and ensure compliance with the intent of the LORS and any special design requirements.

FINDINGS REQUIRED

The Warren Alquist Act requires the commission to "prepare a written decisionwhich includes...(a) Specific provisions relating to the manner in which the proposed facility is to be designed, sited, and operated in order to protect environmental quality and assure public health and safety [and] (d)(1) Findings regarding the conformity of the proposed site and related facilities...with public safety standards...and with other relevant local, regional, state and federal standards, ordinances, or laws..." (Pub. Resources Code, §25523).

SUBJECTS DISCUSSED

Subjects discussed in this analysis include:

- Identification of the LORS applicable to facility design;
- Evaluation of the applicant's proposed design criteria, including the identification of those criteria that are essential to ensuring protection of the environment and public health and safety;
- Proposed modifications and additions to the Application for Certification (AFC) that are necessary to comply with applicable LORS; and
- Conditions of Certification proposed by staff to ensure that the project will be designed and constructed to protect environmental quality and assure public health and safety and comply with all applicable LORS.

SETTING

The applicant, Mirant, proposes to construct and operate the new 540 megawatt (MW) Potrero Power Plant Unit 7 Project (Unit 7). This plant is proposed for construction at the existing Potrero Power Plant, which is located in San Francisco, just south of the central business district, adjacent to the San Francisco Bay. This facility is proposed to be a natural gas fired, combined cycle combustion turbine facility (SECAL 2000a). For more information on the site and related project description, please see **Project Description**.

The site lies in seismic zone 4, the zone of greatest seismic shaking in the United States. Additional engineering design details are contained in the Application for Certification (AFC), Volume II, Appendix E (SECAL 2000a).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

The applicable LORS for each engineering discipline (civil, structural, mechanical and electrical) are described in the following sections of the AFC, Volume II, Appendices (SECAL 2000a).

- Civil Engineering – Appendix E1
- Structural and Seismic Engineering – Appendix E2
- Electrical Engineering – Appendix E3
- Chemical Engineering – Appendix E4
- Mechanical Engineering – Appendix E5
- System Control Engineering – Appendix E6

ANALYSIS

The basis of this analysis is the applicant's proposed analysis and construction methods and list of LORS and design criteria set forth in the AFC.

SITE PREPARATION AND DEVELOPMENT

Staff has evaluated the proposed design criteria for grading, flood protection, erosion control, site drainage, and site access. Staff has assessed the criteria for designing and constructing linear support facilities such as a natural gas pipeline and electric transmission line. The applicant proposes to use accepted industry standards, design practices, and construction methods in preparing and developing the site. (See AFC Section 10.0 and Appendix E for a representative list of applicable government regulations, industry codes, and standards.) Staff concludes that the project, including its linear facilities, will likely comply with all applicable site preparation LORS, and proposes Conditions of Certification (see below) to ensure compliance.

MAJOR STRUCTURES, SYSTEMS AND EQUIPMENT

Major structures, systems and equipment are defined as those structures and associated components or equipment that are necessary for power production and

are costly to repair or replace, that require a long lead time to repair or replace, or that are used for the storage, containment, or handling of hazardous or toxic materials. Major structures and equipment will be identified through compliance with proposed Condition of Certification **GEN-2** (below).

The AFC contains lists of the civil, structural, mechanical and electrical design criteria that demonstrate the likelihood of compliance with applicable LORS, and that staff believes are essential to ensuring that the project is designed in a manner that protects the environment and public health and safety.

The project shall be designed and constructed to the 1998 edition of the California Building Code (CBC), and other applicable codes and standards in effect at the time design and construction of the project actually commence. In the event the initial designs are submitted to the Chief Building Official (CBO) for review and approval when the successor to the 1998 CBC is in effect, the 1998 CBC provisions, identified herein, shall be replaced with the applicable successor provisions.

Certain structures in a power plant may be required, under the CBC, to undergo dynamic lateral force (structural) analysis; others may be designed using the simpler static analysis procedure. In order to ensure that structures are analyzed using the appropriate lateral force procedure, staff has included Proposed Condition of Certification **STRUC-1** (below), which in part requires review and approval by the CBO of the project owner's proposed lateral force procedures prior to the start of construction.

NATURAL GAS PIPELINE

An existing Pacific Gas and Electric Company (PG&E) natural gas pipeline will be used to furnish gas to the site. (If the proposed Golden Gate II project is constructed, PG&E will be required to upgrade the existing natural gas pipeline in order to meet the demands of both power plants.) This line is operated and maintained by PG&E in accordance with U.S. Department of Transportation (DOT), Title 49, Code of Federal Regulations (CFR) Chapter 1, Part 192 "Transportation of Natural and other Gas by Pipeline: Minimum Federal Safety Standards," and the California Public Utilities Commission, General Order 112-E (CPUC GO 112-E). Compliance with these requirements will help mitigate the impacts of pipeline rupture by ensuring proper operation and maintenance of the existing line. Therefore, no mitigation beyond a pipeline operated and maintained to applicable regulations is necessary.

PROJECT QUALITY PROCEDURES

The AFC (SECAL 2000a, § 2.4.6) describes a Project Quality Program that will be used on the project to maximize confidence that systems and components will be designed, fabricated, stored, transported, installed, and tested in accordance with the technical codes and standards appropriate for a powerplant. Compliance with design requirements will be verified through an appropriate program of inspections and audits. Employment of this Quality Assurance/Quality Control (QA/QC) program will ensure that the project is actually designed, procured, fabricated and installed as contemplated in this analysis.

COMPLIANCE MONITORING

Under Section 104.2 of the CBC, the building official is authorized and directed to enforce all the provisions of the CBC. For all energy facilities certified by the Energy Commission, the Energy Commission is the building official and has the responsibility to enforce the code. In addition, the Energy Commission has the power to render interpretations of the CBC and to adopt and enforce rules and supplemental regulations to clarify the application of the CBC's provisions.

The Energy Commission's design review and construction inspection process is developed to conform to CBC requirements and ensure that all facility design Conditions of Certification are met. As provided by Section 104.2.2 of the CBC, the Energy Commission appoints experts to carry out the design review and construction inspections and act as delegate CBO on behalf of the Energy Commission. These delegate agents typically include the local building official and independent consultants hired to cover technical expertise not provided by the local official. The applicant, through permit fees as provided by CBC Sections 107.2 and 107.3, pays the costs of the reviews and inspections. While building permits in addition to the Energy Commission certification are not required for this project, in lieu permit fees are paid by the applicant consistent with CBC Section 107, to cover the costs of reviews and inspections.

Engineering and compliance staff will invite the local building authority, the City and County of San Francisco, to act as CBO for the project. When an entity has been identified to perform the duties of CBO, Energy Commission staff will complete a Memorandum of Understanding (MOU) with that entity that outlines its roles and responsibilities and those of its subcontractors and delegate agents.

Staff has developed proposed Conditions of Certification to ensure protection of the environment and public health and safety and compliance with engineering design LORS. Some of these conditions address the roles, responsibilities and qualifications of the applicant's engineers responsible for the design and construction of the project (proposed Conditions of Certification **GEN-1** through **GEN-8**). Engineers responsible for the design of the civil, structural, mechanical, and electrical portions of the project are required to be registered in California, and to sign and stamp each submittal of design plans, calculations, and specifications submitted to the CBO. These conditions require that no element of construction proceed without prior approval from the CBO. They also require that qualified special inspectors be assigned to perform or oversee special inspections required by the applicable LORS.

While the Energy Commission and delegate CBO have the authority to allow some flexibility in scheduling construction activities, these conditions are written to require that no element of construction of permanent facilities, which would be difficult to reverse or correct, may proceed without prior approval of plans by the CBO. For those elements of construction that are not difficult to reverse and are allowed to proceed without approval of the plans, the applicant shall bear the responsibility to fully modify those elements of construction to comply with all design changes that result from the CBO's plan review and approval process.

FACILITY CLOSURE

The removal of a facility from service, or decommissioning, as a result of the project reaching the end of its useful life, may range from “mothballing” to removal of all equipment and appurtenant facilities and restoration of the site. Future conditions that may affect the decommissioning decision are largely unknown at this time.

In order to assure that decommissioning of the facility will be completed in a manner that is environmentally sound, safe, and will protect public health and safety, the applicant shall submit a decommissioning plan to the Energy Commission for review and approval prior to the commencement of decommissioning. The plan shall include a discussion of the following items:

- proposed decommissioning activities for the project and all appurtenant facilities constructed as part of the project;
- all applicable LORS, local/regional plans, and the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;
- the activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities; and
- decommissioning alternatives, other than complete site restoration.

The above requirements should serve as adequate protection, even in the unlikely event of project abandonment. Staff has proposed general conditions (see **General Conditions**) to ensure that these measures are included in the Facility Closure Plan.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

There have been no public or agency comments relative to **Facility Design**.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. The laws, ordinances, regulations, and standards (LORS) identified in the AFC and supporting documents are those applicable to the project.
2. Staff has evaluated the proposed engineering LORS, design criteria and design methods in the record, and concludes that the design, construction and eventual closure of the project are likely to comply with applicable LORS.
3. The Conditions of Certification proposed will ensure that the proposed facilities are designed and constructed in accordance with applicable LORS. This will occur through the use of design review, plan checking and field inspections, which are to be performed by the CBO or other Energy Commission delegate agent. Staff will audit the CBO to ensure satisfactory performance.

4. The Energy Commission design review and construction inspection process will be in place for the project and will allow construction to start as scheduled if the project is certified. The process will provide the necessary reviews to ensure compliance with applicable facility design LORS and Conditions of Certification.
5. Whereas future conditions that may affect decommissioning are largely unknown at this time, it can reasonably be concluded that if the project owner submits a decommissioning plan as required in the **General Conditions** portion of this document prior to the commencement of decommissioning, the decommissioning procedure is likely to occur in compliance with all applicable LORS.

RECOMMENDATIONS

Energy Commission staff recommends that:

1. The Conditions of Certification proposed herein be adopted to ensure that the project is designed and constructed to protect environmental quality, and assure public health and safety, and to ensure compliance with all applicable engineering LORS;
2. The project be designed and built to the 1998 CBC (or successor standard, if such is in effect when the initial project engineering designs are submitted for review); and
3. The CBO shall review the final designs, conduct plan checking and perform field inspections during construction, and Energy Commission staff shall audit and monitor the CBO to ensure satisfactory performance.

CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct and inspect the project in accordance with the 1998 California Building Code (CBC) and all other applicable LORS in effect at the time initial design plans are submitted to the CBO for review and approval. The CBC in effect is that edition that has been adopted by the California Building Standards Commission and published at least 180 days previously. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

Protocol: In the event that the initial engineering designs are submitted to the CBO when a successor to the 1998 CBC is in effect, the 1998 CBC provisions identified herein shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction, or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

Verification: Within 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) after receipt of the Certificate of Occupancy, the project owner shall submit to the California Energy Commission Compliance Project Manager (CPM) a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation and inspection requirements of the applicable LORS and the Energy Commission's Decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the Certificate of Occupancy within 30 days of receipt from the CBO [1998 CBC, Section 109 – Certificate of Occupancy].

GEN-2 The project owner shall furnish to the CPM and to the CBO a schedule of facility design submittals, a Master Drawing List, and a Master Specifications List. The schedule shall contain a list of proposed submittal packages of designs, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM when requested.

Verification: At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The project owner shall provide schedule updates in the Monthly Compliance Report.

GEN-3 The project owner shall make payments to the CBO for design review, plan check and construction inspection, equivalent to the fees listed in the 1998 CBC, Chapter 1, Section 107 and Table 1-A, Building Permit Fees; Appendix Chapter 33, Section 3310 and Table A-33-A, Grading Plan Review Fees; and Table A-33-B, Grading Permit Fees. If the City of San Francisco or San Francisco County has adjusted the CBC fees for design review, plan check and construction inspection, the project owner shall pay the adjusted fees.

Verification: The project owner shall make the required payments to the CBO at the time of submittal of the plans, design calculations, specifications, or soil reports. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next Monthly Compliance Report indicating that the applicable fees have been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California registered architect, structural engineer or civil engineer, as a resident engineer (RE), to be in general responsible charge of the project [Building Standards Administrative Code (Cal. Code Regs., tit. 24, § 4-209, Designation of Responsibilities)]. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project respectively. A project may be divided into parts, provided each part is clearly defined as a distinct unit. Separate assignment of general responsible charge may be made for each designated part.

Protocol: The RE shall:

1. Monitor construction progress to ensure compliance with LORS;
2. Ensure that construction of all the facilities conforms in every material respect to the applicable LORS, these Conditions of Certification, approved plans, and specifications;
3. Prepare documents to initiate changes in the approved drawings and specifications when directed by the project owner or as required by conditions on the project;
4. Be responsible for providing the project inspectors and testing agency(ies) with complete and up-to-date set(s) of stamped drawings, plans, specifications and any other required documents;
5. Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and
6. Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests as not conforming to the approved plans and specifications.

The RE shall have the authority to halt construction and to require changes or remedial work, if the work does not conform to applicable requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the name, qualifications and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within five days of the approval.

If the RE or the delegated engineer(s) are subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and

approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-5 Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of powerplant structures and equipment supports; D) a mechanical engineer; and E) an electrical engineer. [California Business and Professions Code section 6704 et seq., and sections 6730 and 6736 requires state registration to practice as a civil engineer or structural engineer in California.] All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, powerplant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

Protocol: The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all engineers assigned to the project. [1998 CBC, Section 104.2, Powers and Duties of Building Official.]

If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

Protocol: A: The civil engineer shall:

1. Design, or be responsible for design, stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads, and sanitary sewer systems; and
2. Provide consultation to the RE during the construction phase of the project, and recommend changes in the design of the civil works facilities and changes in the construction procedures.

Protocol: B: The geotechnical engineer or civil engineer, experienced and knowledgeable in the practice of soils engineering, shall:

1. Review all the engineering geology reports, and prepare final soils grading report;
2. Prepare the soils engineering reports required by the 1998 CBC, Appendix Chapter 33, Section 3309.5 – Soils Engineering Report, and Section 3309.6 – Engineering Geology Report;
3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 1998 CBC, Appendix Chapter 33, section 3317, Grading Inspections;
4. Recommend field changes to the civil engineer and RE;
5. Review the geotechnical report, field exploration report, laboratory tests, and engineering analyses detailing the nature and extent of the site soils that may be susceptible to liquefaction, rapid settlement or collapse when saturated under load; and
6. Prepare reports on foundation investigation to comply with the 1998 CBC, Chapter 18 section 1804, Foundation Investigations.

This engineer shall be authorized to halt earthwork and to require changes, if site conditions are unsafe or do not conform to predicted conditions used as a basis for design of earthwork or foundations. [1998 CBC, section 104.2.4, Stop orders.]

Protocol: C: The design engineer shall:

1. Be directly responsible for the design of the proposed structures and equipment supports;
2. Provide consultation to the RE during design and construction of the project;
3. Monitor construction progress to ensure compliance with LORS;
4. Evaluate and recommend necessary changes in design; and
5. Prepare and sign all major building plans, specifications and calculations.

Protocol: D: The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform with all of the mechanical engineering design requirements set forth in the Energy Commission's Decision.

Protocol: E: The electrical engineer shall:

1. Be responsible for the electrical design of the project; and
2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 1998 CBC, Chapter 17, Section 1701, Special Inspections, Section, 1701.5 Type of Work (requiring special inspection), and Section 106.3.5, Inspection and observation program. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

Protocol: The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;
2. Observe the work assigned for conformance with the approved design drawings and specifications;
3. Furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM for corrective action; and
4. Submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans and specifications and the applicable provisions of the applicable edition of the CBC.

A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

Verification: At least 15 days prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next Monthly Compliance Report.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within five days of the approval.

GEN-7 The project owner shall keep the CBO informed regarding the status of engineering and construction. If any discrepancy in design and/or construction is discovered, the project owner shall document the discrepancy and recommend the corrective action required. The discrepancy documentation shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this Condition of Certification and, if appropriate, the applicable sections of the CBC and/or other LORS.

Verification: The project owner shall submit Monthly Compliance Reports to the CBO and CPM. The project owner shall transmit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days of receiving the approval or disapproval. If disapproved, the project owner shall advise the CPM, within five days of the reason for disapproval, and the revised corrective action needed to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. When the work and the "as-built" and "as graded" plans conform to the approved final plans, the project owner shall notify the CPM regarding the CBO's final approval. The marked up "as-built" drawings for the construction of structural and architectural work shall be submitted to the CBO. Changes approved by the CBO shall be identified on the "as-built" drawings [1998 CBC, Section 108, Inspections].

Verification: Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans.

CIVIL-1 Prior to the start of site grading, the project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. Soils report as required by the 1998 CBC, Appendix Chapter 33, Section 3309.5, Soils Engineering Report and Section 3309.6, Engineering Geology Report.

Verification: At least 15 days prior to the start of site grading, the project owner shall submit the documents described above to the CBO for review and approval. In the next Monthly Compliance Report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible geotechnical engineer or civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area. [1998 CBC, Section 104.2.4, Stop orders.]

Verification: The project owner shall notify the CPM, within five days, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within five days of the CBO's approval, the project owner shall provide to the CPM a copy of the CBO's approval to resume earthwork and construction in the affected areas.

CIVIL-3 The project owner shall perform inspections in accordance with the 1998 CBC, Chapter 1, Section 108, Inspections; Chapter 17, Section 1701.6, Continuous and Periodic Special Inspection; and Appendix Chapter 33, Section 3317, Grading Inspection. All plant site-grading operations shall be subject to inspection by the CBO and the CPM.

Protocol: If, in the course of inspection, it is discovered that the work is not being done in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report detailing all discrepancies and non-compliance items, and the proposed corrective action, and send copies to the CBO and the CPM.

Verification: Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a Non-Conformance Report (NCR), and the proposed corrective action. Within five days of resolution of the

NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the following Monthly Compliance Report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage facilities, the project owner shall obtain the CBO's approval of the final "as-graded" grading plans, and final "as-built" plans for the erosion and sedimentation control facilities [1998 CBC, Section 109, Certificate of Occupancy].

Verification: Within 30 days of the completion of the erosion and sediment control mitigation and drainage facilities, the project owner shall submit to the CBO the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes. The project owner shall submit a copy of this report to the CPM in the next Monthly Compliance Report.

STRUC-1 Prior to the start of any increment of construction, the project owner shall submit to the CBO for review and approval the proposed lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be those for:

1. Major project structures;
2. Major foundations, equipment supports and anchorage;
3. Large field fabricated tanks;
4. Turbine/generator pedestal; and
5. Switchyard structures.

In addition, the project owner shall, prior to the start of any increment of construction, get approval from the CBO of the lateral force procedures proposed for project structures to comply with the lateral force provisions of the CBC.

Protocol: The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;
2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (i.e., highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures

shall be filed concurrently with the structure plans, calculations, and specifications [1998 CBC, Section 108.4, Approval Required];

3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures at least 90 days (or a lesser number of days mutually agreed to by the project owner and the CBO), prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation [1998 CBC, Section 106.4.2, Retention of plans and Section 106.3.2, Submittal documents]; and
4. Ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations and specifications shall be signed and stamped by the responsible design engineer [1998 CBC, Section 106.3.4, Architect or Engineer of Record].

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of construction, the project owner shall submit to the CBO, with a copy to the CPM, the responsible design engineer's signed statement that the final design plans, specifications and calculations conform with all of the requirements set forth in the Energy Commission's Decision.

If the CBO discovers non-conformance with the stated requirements, the project owner shall resubmit the corrected plans to the CBO within 20 days of receipt of the nonconforming submittal with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM a copy of a statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and are in conformance with the requirements set forth in the applicable LORS.

STRUC-2 The project owner shall submit to the CBO the required number of sets of the following:

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);
2. Concrete pour sign-off sheets;
3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);
4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and

5. Reports covering other structure activities requiring special inspections shall be in accordance with the 1998 CBC, Chapter 17, Section 1701, Special Inspections, Section 1701.5, Type of Work (requiring special inspection), Section 1702, Structural Observation and Section 1703, Nondestructive Testing.

Verification: If a discrepancy is discovered in any of the above data, the project owner shall, within five days, prepare and submit an NCR describing the nature of the discrepancies to the CBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the Condition(s) of Certification and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 1998 CBC, Chapter 1, Section 106.3.2, Submittal documents, and Section 106.3.3, Information on plans and specifications, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give the CBO prior notice of the intended filing.

Verification: On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the Monthly Compliance Report, when the CBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in Chapter 3, Table 3-E of the 1998 CBC shall, at a minimum, be designed to comply with Occupancy Category 2 of the 1998 CBC.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of installation of the tanks or vessels containing the above specified quantities of highly toxic or explosive substances that would be hazardous to the safety of the general public if released, the project owner shall submit to the CBO for review and approval, final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-1 Prior to the start of any increment of piping construction, the project owner shall submit, for CBO review and approval, the proposed final design drawings, specifications and calculations for each plant piping system (exclude domestic water, refrigeration systems, and small bore piping, i.e., piping and tubing with a diameter less than two and one-half inches). The submittal shall also include the applicable QA/QC procedures. The project owner shall design and install all piping, other than domestic water, refrigeration, and small bore piping to the applicable edition of the CBC. Upon completion of construction of any piping system, the project owner shall request the CBO's inspection approval of said construction [1998 CBC, Section 106.3.2, Submittal documents, Section 108.3, Inspection Requests].

Protocol: The responsible mechanical engineer shall submit a signed and stamped statement to the CBO when:

1. The proposed final design plans, specifications and calculations conform with all of the piping requirements set forth in the Energy Commission's Decision; and
2. All of the other piping systems, except domestic water, refrigeration systems and small bore piping have been designed, fabricated and installed in accordance with all applicable ordinances, regulations, laws and industry standards, including, as applicable:
 - American National Standards Institute (ANSI) B31.1 (Power Piping Code);
 - ANSI B31.2 (Fuel Gas Piping Code);
 - ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
 - ANSI B31.8 (Gas Transmission and Distribution Piping Code); and
 - Specific City/County code.

The CBO may require the project owner to employ special inspectors to report directly to the CBO to monitor shop fabrication or equipment installation [1998 CBC, Section 104.2.2, Deputies].

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of piping construction, the project owner shall submit to the CBO for approval, with a copy of the transmittal letter to the CPM, the above listed documents for that increment of construction of piping systems, including a copy of the signed and stamped engineer's certification of conformance with the Energy Commission's Decision. The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by the applicable LORS. Upon completion of

the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of said installation [1998 CBC, Section 108.3 – Inspection Requests.]

The project owner shall:

1. Ensure that all boilers and fired and unfired pressure vessels are designed, fabricated and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and
2. Have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for review and approval, final design plans, specifications and calculations, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall send copies of the CBO plan check approvals to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's and/or Cal-OSHA inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-3 Prior to the start of construction of any heating, ventilating, air conditioning (HVAC) or refrigeration system, the project owner shall submit to the CBO for review and approval the design plans, specifications, calculations and quality control procedures for that system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

Protocol: The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the applicable edition of the CBC. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of said construction. The final plans, specifications and calculations shall include approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS [1998 CBC, Section 108.7, Other Inspections; Section 106.3.4, Architect or Engineer of Record].

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any HVAC or

refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC, with a copy of the transmittal letter to the CPM.

The project owner shall send copies of CBO comments and approvals to the CPM in the next Monthly Compliance Report. The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-4 Prior to the start of each increment of plumbing construction, the project owner shall submit for CBO's approval the final design plans, specifications, calculations, and QA/QC procedures for all plumbing systems, potable water systems, drainage systems (including sanitary drain and waste), toilet rooms, building energy conservation systems, and temperature control and ventilation systems, including water and sewer connection permits issued by the local agency. Upon completion of any increment of construction, the project owner shall request the CBO's inspection approval of said construction [1998 CBC, Section 108.3, Inspection Requests, Section 108.4, Approval Required].

Protocol: The project owner shall design, fabricate and install:

1. Plumbing, potable water, all drainage systems, and toilet rooms in accordance with Title 24, California Code of Regulations, Division 5, Part 5 and the California Plumbing Code (or other relevant section(s) of the currently adopted California Plumbing Code and Title 24, California Code of Regulations); and
2. Building energy conservation systems and temperature control and ventilation systems in accordance with Title 24, California Code of Regulations, Division 5, Chapter 2-53, Part 2.

The final plans, specifications and calculations shall clearly reflect the inclusion of approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall stamp and sign all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with all of the requirements set forth in the Energy Commission's Decision.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any of the above systems, the project owner shall submit to the CBO the final design plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the next Monthly Compliance Report following completion of that increment of construction.

ELEC-1 For the 480 volts and higher systems, the project owner shall not begin any increment of electrical construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS [1998 CBC, Section 108.4, Approval Required, and Section 108.3, Inspection Requests]. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

Protocol: The following activities shall be reported in the Monthly Compliance Report:

- receipt or delay of major electrical equipment; and
- testing or energization of major electrical equipment.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for electrical equipment and systems 480 volts and greater, including a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

ELEC-2 The project owner shall submit to the CBO the required number of copies of items A and B for review and approval and one copy of item C [CBC 1998, Section 106.3.2, Submittal documents]. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

Protocol: A. Final plant design plans to include:

1. one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems;
2. system grounding drawings;
3. general arrangement or conduit drawings; and
4. other plans as required by the CBO.

Protocol: B. Final plant calculations to establish:

1. short-circuit ratings of plant equipment;
2. ampacity of feeder cables;
3. voltage drop in feeder cables;
4. system grounding requirements;

5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;
6. system grounding requirements;
7. lighting energy calculations; and
8. other reasonable calculations as customarily required by the CBO.

Protocol: C. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission Decision.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of electrical equipment installation, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations, for electrical equipment and systems 480 volts and greater enumerated above, including a copy of the signed and stamped statement from the responsible electrical engineer certifying compliance with the applicable LORS. The project owner shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

REFERENCES

- SECAL (Southern Energy California). 2000a. Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, May 31.
- SECAL (Southern Energy California). 2000b. Supplemental Information in Response to CEC Data Adequacy Request, Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, August 31.

GEOLOGY AND PALEONTOLOGY

Neal Mace

INTRODUCTION

The geology and paleontology section discusses the setting Mirant's Potrero Power Plant Unit 7 Project (Unit 7) and its potential impacts regarding geological hazards, geological and paleontological resources, and surface water hydrology. The purpose of this analysis is to verify that the applicable laws, ordinances, regulations, and standards (LORS) have been identified and that the project can be designed and constructed in accordance with all applicable LORS, and in a manner that protects environmental quality and assures public health and safety. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts to significant geological and paleontological resources, and surface water hydrology during project construction, operation and closure. The section concludes with the staff's proposed monitoring and mitigation measures with respect to geological hazards, geological and paleontological resources, and surface water hydrology, with the inclusion of nine conditions of certification.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

The applicable LORS are listed in the Application for Certification (AFC), in Sections 8.14, 8.15, and 8.16 (SECAL 2000a). A brief description of the LORS for paleontological resources, geological hazards and resources, and surface water hydrology follows:

FEDERAL

There are no federal LORS for geological hazards and resources, or grading and erosion control. Unit 7 will not be located on lands owned by the United States Government.

STATE AND LOCAL

The California Building Code (CBC) 1998 edition is based upon the Uniform Building Code (UBC), 1997 edition, which was published by the International Conference of Building Officials. The CBC is a series of standards that are used in investigation, design (Chapters 16 and 18) and construction (including grading and erosion control as found in Appendix Chapter 33). The CBC supplements the UBC's grading and construction ordinances and regulations.

The California Environmental Quality Act (CEQA) Guidelines, Appendix G, provides a checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts.

- Section (V) (c) asks if the project will directly or indirectly destroy a unique paleontological resource or site or unique geological feature.

- Sections (VI) (a), (b), (c), (d), and (e) pose questions that are focused on whether or not the project would expose persons or structures to geological hazards.
- Sections (X) (a) and (b) pose questions about the project's effect on mineral resources.

The Standard Procedures, Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources (SVP 1994) are a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. They were adopted in October 1994 by a national organization of vertebrate paleontologists (the Society of Vertebrate Paleontologists).

SETTING

The Unit 7 proposal is a 540 megawatt natural gas-fired combined cycle generation facility located at the existing Potrero Power Plant (PPP) site. The proposed unit will utilize the existing natural gas supply line. In addition, the proposed project will include a new underground transmission connection to Pacific Gas and Electric's Hunters Point Substation and the demolition of the station "A" complex.

The PPP facility is located on Potrero Point along the west shore of San Francisco Bay. Potrero Point lies within the Hunters Point Shear Zone. The shear zone is part of the late Cretaceous to Early Tertiary Coast Range Thrust Fault that juxtaposed the Franciscan Formation and Great Valley Sequence. The California Division of Mines and Geology (1994) considers the shear zone inactive. Bedrock associated with the shear zone is not well exposed in the project area. Outcrops are limited to a serpentinite knob located approximately 0.2 miles to the north of the project site and Potrero Hill, to the west, where cataclasite and serpentinite are found at the ground surface or beneath a thin layer of artificial fill.

Potrero Point was originally a spur of Potrero Hill that rose to a height of over 100 feet. During the 19th Century the bay and tidelands immediately adjacent to Potrero Point were reclaimed, in part, with rock quarried from Potrero Point (Olmsted et. al., 1982). The project site spans the bedrock that originally formed Potrero Point and the tidelands reclaimed from the bay. The serpentinite bedrock varies in depth underneath the existing Potrero Power Plant site from a depth of generally less than five feet below grade in the northwest corner of the site, to up to eighty-five feet below grade immediately adjacent to the bay. In addition to this general trend of bedrock increasing in depth from west to east, the depth to bedrock increases to more than 50 feet below grade in the southwest corner of the site (Dames and Moore, 2000).

The entire site is mantled by artificial fill. Beneath the footprint of the proposed Unit 7, between 5 and 20 feet of fill overlie serpentinite bedrock, tidal flat deposits of bay mud and/or alluvium in the southwest corner of the site. The western half of the proposed water-pipeline alignment along the southern margin of the PPP site will be founded on bedrock, while the eastern half of the pipeline will overlie fill and bay

mud deposits. The proposed cooling water intake structure will overlie fill and bay mud deposits along the margin of San Francisco Bay.

The transmission line will cross under Islais Creek. With the exception of the Islais Creek crossing the artificial fill covers the entire electrical transmission line alignment.

The project site is paved. No indications of surface faulting were observed at the site during the site visit. In addition, no known active faults cross the Unit 7 footprint.

ANALYSIS AND IMPACTS

GEOLOGICAL HAZARDS

FAULTING AND SEISMICITY

Energy Commission staff reviewed the California Division of Mines and Geology publication "Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions," dated 1994 (CDMG 1994). No active or potentially active faults are known to cross the power plant footprint. The project is located within seismic zone 4 as delineated on Figure 16-2 of the 1998 edition of the CBC. The closest known active fault is the San Andreas fault, which is located 13.6 kilometers west of the project site. This fault is designated a class "A" fault under the CBC (a fault with a maximum magnitude earthquake greater than 7 and a slip rate in excess of 5 mm/year). The maximum magnitude earthquake for the segment of San Andreas fault closest to the project is a moment magnitude 7.9 event. The slip rate for this section of the San Andreas fault is 24 mm/year (ICBO 1998, Table 1). In April 1906 the San Francisco Bay region experienced a moment magnitude 7.9 earthquake. Using the Abrahamson-Silva 1997 attenuation relationship, a moment magnitude 7.9 earthquake on the San Andreas fault whose epicenter is 13.6 kilometers west-southwest of the project site would produce an estimated peak horizontal bedrock acceleration for the power plant site of 0.65g. This value is generally consistent with the California Division of Mines and Geology (CDMG) Map Sheet 48, which predicts a peak ground acceleration with a 10 percent chance of exceedance in 50 years of between 0.5 and 0.6g for the project area. The Potrero Power Plant's Unit "A" occupied the site of the proposed facility, during the 1906 San Francisco earthquake. No significant damage to the station "A" complex occurred during the 1906 earthquake. The station "A" complex is no longer operated and for the most part had been torn down before the Loma Prieta earthquake in 1989. However, Unit three was in operation during the Loma Prieta earthquake. No significant damage to the existing power plant, including the fill pad, was reported after the Loma Prieta earthquake (Benuska, 1990, page 317). The project is located approximately 28 miles north of the epicenter of the Loma Prieta earthquake.

The potential of surface rupture on a fault at the power plant footprint is considered to be very low, since no active faults are known to have ruptured the ground surface

of the project site. However, the potential for fault rupture can not be completely ruled out since the site is located within the Hunters Point shear zone.

LIQUEFACTION, HYDROCOMPACTION, AND EXPANSIVE SOILS

Liquefaction is a condition in which a cohesionless soil loses its shear strength due to a sudden increase in pore water pressure. The CDMG's Seismic Hazard Map for the City and County of San Francisco (CDMG 2000) indicates that the eastern half and southwest corner of the PPP site is located in a liquefaction hazard zone. The distribution of potentially liquefiable soils depicted on the CDMG's map correlates to areas where the top of bedrock is below sea level. The soils most prone to liquefaction during earthquakes are fine-grained, poorly graded, saturated sands and silts.

The depth to groundwater at the proposed site generally varies from approximately 2 feet below existing grade to 14.5 feet below existing grade. In the northwest corner of the site no free ground water was encountered in an 80 foot deep boring that penetrated into the bedrock beneath the site. The combination of saturated soils of varying density and a potential for a moderately high peak horizontal ground acceleration points to a moderate potential for liquefaction at the site. The liquefaction potential of saturated bay mud deposits beneath the site is low due to the cohesion of the clay deposits. However, the loose granular artificial fill may have a moderate to high potential for liquefaction. This conclusion is supported by reported evidence of liquefaction in the vicinity of Islais Creek channel following the 1989 Loma Prieta Earthquake. Due to the heterogeneous character of the fill, potentially liquefiable soils are expected to occur as zones or pockets, rather than as horizontally or vertically continuous layers. The potential for liquefaction induced lateral spreading within the fill is considered low because of the low surface gradients at the project site and the heterogeneous nature of the fill. Localized subsidence due to seismically induced densification of loose granular zones of fill is considered the most likely expression of liquefaction at the project site. Liquefaction of saturated zones of loose granular fill may also occur along the proposed transmission line alignment. Liquefaction is to be accounted for during the final design of the project's foundation.

Hydrocompaction is the process of the loss of soil volume upon the application of water. The soils at the site are dense enough and are relatively saturated so that hydrocompaction is not considered to be a significant problem.

Soils that contain a high percentage of expansive clay minerals are prone to expansion, if subjected to an increase in water content. Expansive soils are usually measured with an index test such as the expansive index potential. In order for a soil to be a candidate for testing, the soil must have a high clay content and the clay must have a high shrink-swell potential and a high plasticity index. The fill beneath the project site is expected to be primarily granular and near surface soils beneath the fill are typically saturated. As a result, the potential for damage to the project facilities from expansive soils is expected to be low.

LANDSLIDES

Landsliding potential at the power plant site is considered to be low, since the project is located on a fill pad that has a slope of between 1 and 2 %, and there are no slopes adjacent to the site except at the edge of the San Francisco Bay. The electric transmission line route also has a low potential for slope failure because slope gradients along the alignment will typically be less than 5 percent.

GEOLOGICAL AND PALEONTOLOGICAL RESOURCES

No geological resources have been identified at the power plant location, the natural gas supply line route, or the water supply line route. However, the northernmost one third of the power plant footprint is located in mineral resource zone (MRZ) MRZ-1 and the rest of the footprint is zoned MRZ-3 (CDMG 1987). The MRZ-1 designation means that there are no known mineralogical resources, while the MRZ-3 designation indicates that there are known mineralogical resources, but the existing available geologic data is not sufficient to assess the significance of the mineralogical resources. Mineralogical resources in the vicinity of the project include sand and gravel.

The proposed expansion site footprint is highly disturbed. During the construction of the original Potrero Power Plant, on-site soils were disturbed and used as fill throughout portions of the site. No significant paleontological resources were reported during the construction of the original Potrero Power Plant. Energy Commission staff has reviewed Appendix P "Paleontological Resources Assessment" of the applicant's report entitled "Potrero Power Plant Unit 7 Project" (SECAL, 2000b). The assessment includes notes from a field survey and archives search. The archives search did not indicate that any paleontologic resources were known to be located at the project site. A paleontological resources field survey was conducted at the project site and one mile west of the site on December 14, 1999. The western survey area was included due to notes made during the search of the paleontological archives. No significant paleontological resources were encountered during the field survey.

SURFACE WATER HYDROLOGY

The project is proposed to have a base elevation of 25 feet above mean sea level (SECAL 2000a, figure 2-2). The estimated peak inundation elevation due to a combination of a 100-year high tide and a tsunami is 18.5 feet above mean sea level (SECAL 2000a, page 8.14-11). Minimum grade for the power plant area will be 1 percent and all drainage will be directed away from buildings within the footprint. The 100-year 24-hour storm event precipitation amount is 5.0 inches (NOAA 1973). Due to the demolition of existing structures and the construction of Potrero PP in an area already serviced by the existing surface water drainage system, the project should have no net effect on the quantity of surface water collected and discharged off-site.

SITE SPECIFIC IMPACTS

Excavations, drilling, clearing and brushing operations, and grading of the fill and alluvium at the power plant site associated with construction of the project are

considered to present a low potential impact to paleontological resources. At the time that this document was prepared, the site was not known to contain any fossils. The adoption and implementation of the proposed conditions of certification for paleontological resources should mitigate any potential impacts to paleontological resources associated with the construction of this project.

The site overlies Mineral Resource Zones MZ-1 and MZ-3. These are areas of no known mineral resources and of potential mineral resources that have not been evaluated, respectively.

The discussion of the potential impacts with respect to water quality, including the impacts on turbidity and temperature, is deferred to the **Soils and Water Resources** section of this document. Storm water run-off is proposed to be managed through the proposed power plant's drainage control plan and by complying with the proposed conditions of certification for the **Soils and Water Resources** section of this document.

None of the geological and paleontological resources, identified by the applicant or by Energy Commission staff are considered to be significantly impacted by the construction and operation of the proposed project. In addition, the project is not likely to have any significant impact on surface water hydrology as well.

CUMULATIVE IMPACTS

It is staff's opinion that the potential for significant adverse cumulative impacts on paleontological resources, geological resources, or surface water hydrology is unlikely, if Unit 7 is constructed according to the proposed conditions of certification. This opinion is based on the fact that the site is not known to have significant paleontological or geological resources.

FACILITY CLOSURE

A definition and general approach to closure is presented in the **General Conditions** section of this document. Facility closure activities are not anticipated to impact geological or paleontological resources. This is due to the fact that no paleontological or geological resources are known to exist at the power plant location. In addition, decommissioning and closure of the power plant should not negatively affect geological or paleontological resources since the majority of the ground disturbed in plant decommissioning and closure would have been disturbed in the construction of the plant. Surface water hydrology impacts will depend upon the closure activities proposed.

MITIGATION

Based upon the literature and archives search, field surveys and the preliminary geotechnical investigation for the project, the applicant has proposed monitoring and mitigation measures to be followed during the construction of the power plant, related natural gas supply line, electrical transmission line, and the waste water pipelines. Energy Commission staff agree with the applicant that there is a low

probability that vertebrate fossils will be encountered during construction of the power plant and related features.

The proposed conditions of certification are to allow the Energy Commission Compliance Project Manager (CPM) and the applicant to adopt a compliance monitoring scheme that will ensure compliance with LORS applicable to geological hazards, geological and paleontological resources, and surface water hydrology for the project.

CONCLUSION AND RECOMMENDATIONS

The applicant will likely be able to comply with applicable LORS. The project should have no adverse impact with respect to geological and paleontological resources and surface water hydrology. Staff proposes to ensure compliance with applicable LORS for geological hazards, geological and paleontological resources and surface water hydrology with the adoption of the proposed conditions of certification listed below, and the conditions of certification for surface water hydrology, which are located in the **Soils and Water Resources** section of this document.

PROPOSED CONDITIONS OF CERTIFICATION

GEO-1 Prior to the start of construction, the project owner shall assign to the project an engineering geologist(s), certified by the State of California, to carry out the duties required by the 1998 edition of the California Building Code (CBC) Appendix Chapter 33, Section 3309.4. The certified engineering geologist(s) assigned must be approved by the Compliance Project Manager (CPM). A responsible geotechnical engineer may also perform the functions of the engineering geologist, if that person has the appropriate California license.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the Chief Building Official (CBO)) prior to the start of construction, the project owner shall submit to the CPM, for approval, the name(s) and license number(s) of the certified engineering geologist(s) or geotechnical engineer(s) assigned to the project. The submittal should include a statement that CPM approval is needed. The CPM will approve or disapprove of the engineering geologist(s) or geotechnical engineer(s) and will notify the project owner of its findings within 15 days of receipt of the submittal. If the engineering geologist(s) or geotechnical engineer(s) are subsequently replaced, the project owner shall submit for approval the name(s) and license number(s) of the newly assigned individual(s) to the CPM. The CPM will notify the project owner of their approval or disapproval of the engineering geologist(s) or geotechnical engineer(s) within 15 days of receipt of the notice of personnel change.

GEO-2 The assigned engineering geologist(s) or geotechnical engineer(s) shall carry out the duties required by the 1998 CBC, Appendix Chapter 33, Section

3309.4- Engineered Grading Requirement, and Section 3318.1 – Final Reports. Those duties are:

1. Prepare the Engineering Geology Report. This report shall accompany the Plans and Specifications when applying to the CBO for the grading permit.
2. Monitor geologic conditions during construction.
3. Prepare the Final Engineering Geology Report.

Protocol: The Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3309.3 Grading Designation, shall include an adequate description of the geology of the site, conclusions and recommendations regarding the effect of geologic conditions, including the liquefaction potential and foundation conditions, on the proposed development, and an opinion on the adequacy of the site for the intended use as affected by geologic factors.

The Final Engineering Geology Report to be completed after completion of grading, as required by the 1998 CBC Appendix Chapter 33, Section 3318.1, shall contain the following: A final description of the geology of the site and any new information disclosed during grading; and the effect of same on recommendations incorporated in the approved grading plan. The engineering geologist shall also submit a statement that, to the best of his or her knowledge, the work within his or her area of responsibility is in accordance with the approved Engineering Geology Report and applicable provisions of this chapter.

Verification: (1) Within 15 days after submittal of the application(s) for grading permit(s) to the CBO, the project owner shall submit a signed statement to the CPM stating that the Engineering Geology Report has been submitted to the CBO as a supplement to the plans and specifications and that the recommendations contained in the report are incorporated into the plans and specifications. (2) Within 90 days following completion of the final grading, the project owner shall submit copies of the Final Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3318- Completion of Work, to the CBO, and to the CPM on request.

PAL-1 Prior to the start of any project-related construction activities (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), the project owner shall ensure that the designated paleontological resource specialist approved by the CPM is available for field activities and prepared to implement the conditions of certification.

The designated paleontological resource specialist shall be responsible for implementing all the paleontological conditions of certification and for using qualified personnel to assist in this work.

Protocol: The project owner shall provide the CPM with the name and statement of qualifications for the designated paleontological resource specialist.

The statement of qualifications for the designated paleontological resources specialist shall demonstrate that the specialist meets the following minimum qualifications: a degree in paleontology or geology or paleontological resource management; and at least three years of paleontological resource mitigation and field experience in California, including at least one year's experience leading paleontological resource mitigation and field activities.

The statement of qualifications shall include a list of specific projects the specialist has previously worked on; the role and responsibilities of the specialist for each project listed; and the names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

If the CPM determines that the qualifications of the proposed paleontological resource specialist do not satisfy the above requirements, the project owner shall submit another individual's name and qualifications for consideration.

If the approved, designated paleontological resource specialist is replaced prior to completion of project mitigation, the project owner shall obtain CPM approval of the new designated paleontological resource specialist by submitting the name and qualifications of the proposed replacement to the CPM, at least ten (10) days prior to the termination or release of the preceding designated paleontological resource specialist.

Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

Verification: At least ninety (90) days prior to the start of construction, the project owner shall submit the name and resume and the availability for its designated paleontological resource specialist, to the CPM for review and approval. The CPM shall provide written approval or disapproval of the proposed paleontological resource specialist.

At least ten (10) days prior to the termination or release of a designated paleontological resource specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and resume of the proposed new designated paleontological resource specialist. Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

PAL-2 Prior to the start of project construction, the designated paleontological resource specialist shall prepare a Paleontological Resources Monitoring and

Mitigation Plan to identify general and specific measures to minimize potential impacts to sensitive paleontological resources, and submit this plan to the CPM for review and approval. After CPM approval, the project owner's designated paleontological resource specialist shall be available to implement the Monitoring and Mitigation Plan, as needed, throughout project construction.

In addition to the project owner's adoption of the guidelines of the Society of Vertebrate Paleontologists (SVP 1994), the Paleontological Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures:

- A discussion of the sequence of project-related tasks, such as any pre-construction surveys, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; fossil preparation and recovery; identification and inventory; preparation of final reports; and transmittal of materials for curation;
- Identification of the person(s) expected to assist with each of the tasks identified within this condition for certification, and a discussion of the mitigation team leadership and organizational structure, and the inter-relationship of tasks and responsibilities;
- Where monitoring of project construction activities is deemed necessary, the extent of the areas where monitoring is to occur and a schedule for the monitoring;
- An explanation that the designated paleontological resource specialist shall have the authority to halt or redirect construction in the immediate vicinity of a vertebrate fossil find until the significance of the find can be determined;
- A discussion of equipment and supplies necessary for recovery of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;
- Inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontologists standards and requirements for the curation of paleontological resources; and
- Identification of the institution that has agreed to receive any data and fossil materials recovered during project-related monitoring and mitigation work, discussion of any requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution.

Verification: At least sixty (60) days prior to the start of construction on the project, the project owner shall provide the CPM with a copy of the Monitoring and Mitigation Plan prepared by the designated paleontological resource specialist for review and approval. If the plan is not approved, the project owner, the designated paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes.

PAL-3 Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the designated paleontological resource specialist shall prepare and conduct CPM-approved training to all project managers, construction supervisors, and workers who operate ground disturbing equipment. The project owner and construction manager shall provide the workers with the CPM-approved set of procedures for reporting any sensitive paleontological resources or deposits that may be discovered during project-related ground disturbance.

Protocol: The paleontological training program shall discuss the potential to encounter paleontological resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training shall also include the set of reporting procedures that workers are to follow if paleontological resources are encountered during project activities. The training program shall be presented by the designated paleontological resource specialist and may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

Verification: At least (30) thirty days prior to the start of project construction, the project owner shall submit to the CPM for review, comment, and written approval, the proposed employee training program and the set of reporting procedures the workers are to follow if paleontological resources are encountered during project construction.

If the employee training program and set of procedures are not approved, the project owner, the designated paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes, before the beginning of construction.

Documentation for training of additional new employees shall be provided in subsequent Monthly Compliance Reports, as appropriate.

PAL-4 The designated paleontological resource specialist or designee shall be present at all times he or she deems appropriate to monitor construction-related grading, excavation, trenching, and/or augering in areas where potentially fossil-bearing sediments have been identified. If the designated paleontological resource specialist determines that full-time monitoring is not

necessary in certain portions of the project area or along portions of the linear facility routes, the designated specialist shall notify the project owner.

Verification: The project owner shall include in the Monthly Compliance Reports a summary of paleontological activities conducted by the designated paleontological resource specialist.

PAL-5 The project owner, through the designated paleontological resource specialist, shall ensure recovery, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files copies of signed contracts or agreements with the designated paleontological resource specialist and other qualified research specialists who will ensure the necessary data and fossil recovery, mapping, preparation for analysis, analysis, identification and inventory, and preparation for and delivery of all significant paleontological resource materials collected during data recovery and mitigation for the project. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Paleontological Resources Report and shall keep these files available for periodic audit by the CPM.

PAL-6 The project owner shall ensure preparation of a Paleontological Resources Report by the designated paleontological resource specialist. The Paleontological Resources Report shall be completed following completion of the analysis of the recovered fossil materials and related information. The project owner shall submit the paleontological report to the CPM for approval.

Protocol: The report shall include, but not be limited to, a description and inventory list of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the paleontological resource specialist that project impacts to paleontological resources have been mitigated.

Verification: The project owner shall submit a copy of the Paleontological Resources Report to the CPM for review and approval under a cover letter stating that it is a confidential document. The report is to be prepared by the designated paleontological resource specialist within 90 days following completion of the analysis of the recovered fossil materials.

PAL-7 The project owner shall include in the facility closure plan a description regarding the facility closure activity's potential to impact paleontological resources. The conditions for closure will be determined when a facility closure plan is submitted to the CPM twelve months prior to closure of the

facility. If no activities are proposed that would potentially impact paleontological resources, then no mitigation measures for paleontological resource management are required in the facility closure plan.

Protocol: The closure requirements for paleontological resources are to be based upon the Paleontological Resources Report and the proposed grading activities for facility closure.

Verification: The project owner shall include a description of closure activities described above in the facility closure plan.

REFERENCES

- Abrahamson, N. and W. Silva. 1997. Equations for Estimating Horizontal Response Spectra and Peak Acceleration from Western North American Earthquakes: A Summary of Recent Work, in *Seismological Research Letters*, Volume 68, Number 1, January February 1997, pages 128-153.
- Benuska, L. (editor). May 1990. Supplement to Volume 6, Loma Prieta Earthquake Reconnaissance Report, in *Earthquake Spectra*. Page 317.
- CCSF (City and County of San Francisco). CCSF2000AFC1, comments on Data Adequacy, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission, June 23.
- California Building Standards Commission. 1998. 1998 California Building Code. Volumes 1 and 2.
- CDMG (California Division of Mines and Geology). 1987. Mineral Land Classification: Aggregate Materials in the San Francisco- Monterey Bay Area Part II Classification of Aggregate Resource Areas South San Francisco Bay Production-Consumption Region. Special Report No. 146, Part 11.
- CDMG (California Division of Mines and Geology). 1992. Geologic Map of California, San Francisco-San Jose Quadrangle, Scale 1:250,000.
- CDMG (California Division of Mines and Geology). 1994. Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions, Scale: 1:750,000.
- CDMG (California Division of Mines and Geology). 1999. Seismic Shaking Hazard Maps of California; CDMG Map Sheet 48.
- CDMG (California Division of Mines and Geology). 2000. Seismic Hazard Zone Map of the City and County of San Francisco; CDMG Seismic Hazard Mapping Program.

- FEMA (Federal Emergency Management Agency).1987. Flood Insurance Rate Map No. 060025-0145 B, panel 145, dated July 16, 1987.
- International Conference of Building Officials. 1997. 1997 Uniform Building Code, Volume 2.
- NOAA (National Oceanic and Atmospheric Administration). 1973. Precipitation-Frequency Atlas of the Western United States, Volume XI-California, Figure 31.
- Olmsted, R., Olmstead, N., Fredrickson, D., Bente, V., 1982, San Francisco Bayside, Historical Cultural Resource Survey, prepared for the San Francisco Clean Water Program by Resource Consultants, 304 pp.
- SECAL (Southern Energy California). 2000a. Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, May 31.
- SECAL (Southern Energy California). 2000b. Supplemental Information in Response to CEC Data Adequacy Request, Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, August 31.
- SECAL (Southern Energy California). SECAL2001P Comm1. Southern Energy California (SECAL) comments on the Preliminary Staff Assessment, Set 1, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission, August 2000.
- SVP (Society of Vertebrate Paleontologists). 1994. Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources: Standard Procedures. October 1994.
- USGS (United States Geological Survey) .1972. Maps Showing Areas of Potential Inundation by Tsunamis in the San Francisco Bay Region, California, Miscellaneous Field Studies MF 480, (Sheet 1 of 2).

POWER PLANT EFFICIENCY

James C. Henneforth

INTRODUCTION

The Energy Commission makes findings as to whether energy use by the Potrero Power Plant Unit 7 Project (Unit 7) will result in significant adverse impacts on the environment, as defined in the California Environmental Quality Act (CEQA). If the Energy Commission finds that the consumption of energy creates a significant adverse impact, it must determine whether there are any feasible mitigation measures that could eliminate or minimize the impacts. In this analysis staff addresses the issue of inefficient and unnecessary consumption of energy.

In order to support the Energy Commission's findings, this analysis will:

- determine whether the facility will likely present any adverse impacts upon energy resources;
- determine whether these adverse impacts are significant; and if so,
- determine whether feasible mitigation measures exist that would eliminate the adverse impacts, or reduce them to a level of insignificance.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

No federal laws apply to the efficiency of this project.

STATE

CALIFORNIA ENVIRONMENTAL QUALITY ACT GUIDELINES

CEQA Guidelines state that the environmental analysis "...shall describe feasible measures which could minimize significant adverse impacts, including where relevant, inefficient and unnecessary consumption of energy" (Cal. Code Regs., tit. 14, § 15126.4(a)(1)). Appendix F of the Guidelines further suggests consideration of such factors as the project's energy requirements and energy use efficiency; its effects on local and regional energy supplies and energy resources; its requirements for additional energy supply capacity; its compliance with existing energy standards; and any alternatives that could reduce wasteful, inefficient and unnecessary consumption of energy (Cal. Code regs., tit. 14, § 15000 et seq., Appendix F).

LOCAL

No local or county ordinances apply to power plant efficiency.

SETTING

Mirant proposes to construct and operate a (nominal) 540 MW base load combined cycle merchant power plant to generate and sell electric energy and capacity into the deregulated electricity marketplace (SECAL 2000a, AFC § 1.1). Unit 7 will consist of two GE Frame FA combustion turbines in a two-on-one combined cycle configuration with one steam turbine. Each heavy-duty combustion turbine generator (CTG) is nominally rated at 175 MW, at 59°F and 60% relative humidity ambient conditions. Each CTG will exhaust into a supplementary fired, natural circulation, reheat type heat recovery steam generator (HRSG) with three pressure levels. Steam from both of the HRSGs will be admitted into a single condensing reheat steam turbine that will nominally generate 200 MW of electrical power. The total net output of the combined cycle, with CTG evaporative inlet air cooling, will be approximately 540 MW. The CTGs will be equipped with dry low-NOx combustors, and the HRSGs will be designed with Selective Catalytic Reduction (SCR) to reduce the emissions of NOx. Each HRSG will also include an oxidation CO catalyst system designed to reduce the carbon monoxide produced in firing natural gas in the CTG and in the duct burner (SECAL 2000a, AFC §§ 1.4, 2.2.3.1, 2.2.3.2, 2.2.3.3, 2.2.10).

ANALYSIS

ADVERSE IMPACTS ON ENERGY RESOURCES

The inefficient and unnecessary consumption of energy, in the form of non-renewable fuels such as natural gas and oil, constitutes an adverse environmental impact. An adverse impact can be considered significant if it results in:

- adverse effects on local and regional energy supplies and energy resources;
- a requirement for additional energy supply capacity;
- noncompliance with existing energy standards; or
- the wasteful, inefficient and unnecessary consumption of fuel or energy.

PROJECT ENERGY REQUIREMENTS AND ENERGY USE EFFICIENCY

Any power plant large enough to fall under Energy Commission siting jurisdiction will consume large amounts of energy. Unit 7 will burn natural gas at an approximate rate of 86.4 billion Btu per day at normal full load. This is a substantial rate of energy consumption, and holds the potential to impact energy supplies. Unit 7 in the combined cycle configuration will achieve an efficiency of approximately 56% LHV (Lower Heating Value). This may be compared to the average fuel efficiency of a typical utility company base load conventional steam power plant at approximately 35 percent LHV.

ADVERSE EFFECTS ON ENERGY SUPPLIES RESOURCES

The applicant has described its sources of supply of natural gas for the proposed Unit 7 (SECAL 2000a, AFC §§ 2.2.5, 2.4.4). The project will burn natural gas from the existing Pacific Gas and Electric (PG&E) pipeline located at the site. The gas supply infrastructure is extensive, offering access to vast reserves of gas from the Rocky Mountains, Canada and the Southwest. This source represents far more gas than would be required for a project this size. Energy Commission predictions are that natural gas supplies will be adequate for many years into the future. It is therefore highly unlikely that Unit 7 could pose an increase in demand for natural gas that would adversely affect supplies to California. There is no real likelihood that Unit 7 will require the development of additional energy supply capacity.

ADDITIONAL ENERGY SUPPLY REQUIREMENTS

The supply of natural gas fuel to the project will be from the resource and delivery systems serving gas to California from the east using fields in the southwest, Rocky Mountains, and Canada. While there are seasonal variations that affect pricing, the reserves consist of vast resources and the pipeline systems delivering the gas are well established and sufficiently sized to meet the requirements of the Northern California area, including the needs of Unit 7. There appears no real likelihood that Unit 7 will require the development of new sources of energy.

COMPLIANCE WITH ENERGY STANDARDS

No standards apply to the efficiency of Unit 7 or other non-cogeneration projects.

ALTERNATIVES TO REDUCE WASTEFUL, INEFFICIENT AND UNNECESSARY ENERGY CONSUMPTION

Unit 7 could be deemed to create significant adverse impacts on energy resources if alternative designs existed that would reduce the project's use of fuel. Evaluation of alternatives to the project that could reduce wasteful, inefficient or unnecessary energy consumption first requires examination of the project's energy consumption. Project fuel efficiency, and therefore its rate of energy consumption, is determined by the configuration of the power producing system and by the selection of equipment used to generate power.

PROJECT CONFIGURATION

Unit 7 will be configured as a combined cycle power plant, in which electricity is generated by two gas turbines, and additionally by one reheat steam turbine that operates on heat energy recuperated from the gas turbines' exhaust (SECAL 2000a, AFC §§ 1.4, 2.2.3.2). By recovering this heat, which would otherwise be lost up the exhaust stacks, the efficiency of any combined cycle power plant is increased considerably from that of either gas turbines or steam turbines operating alone. Such a configuration is well suited to the large, steady loads met by a base load plant, which are intended to supply energy efficiently for long periods of time.

The number of turbines further contributes to efficiency at part load. Gas turbine generators operate most efficiently at one particular output level, typically at full load. Whenever desired output is less than full load, the unit must be throttled back.

Rather than being forced to throttle back both large turbines, with the consequent reduction in efficiency, the power plant operator will have the option of shutting off one of the gas turbines. This allows the plant to generate at half load while maintaining maximum efficiency, suitable for a plant meant for flexible generation, such as load-following and peaking duty.

EQUIPMENT SELECTION

Modern gas turbines in combined cycle mode embody the most fuel-efficient electric generating technology available today. The heavy-duty GE Frame FA gas turbines, to be employed in Unit 7, represent some of the most modern and efficient machines now available. The applicant will employ a two-on-one GE combined cycle power train (SECAL, 2000a, AFC §§ 1.4, 2.2.2). The two-on-one configuration (two CTGs and one steam turbine) design is nominally rated at 540 MW and approximately 56 percent efficiency LHV at ISO conditions (defined as International Standards Organization standard conditions of 59°F, 60% relative humidity, and sea level elevation). Possible alternative combustion turbines are the ABB K24 and the Siemens-Westinghouse 501F. These machines are functionally equivalent and considered to be an equivalent class of machines to the GE Frame FA with efficiencies and outputs within a few percentage points. Therefore, any differences among the three in actual operating efficiency will be considered insignificant. Therefore, selection among these machines is thus based on other factors such as market price and equipment availability.

EFFICIENCY OF ALTERNATIVES TO THE PROJECT

The project objectives are to maintain the quality and reliability of San Francisco's electrical energy supply, to sell the output into California's restructured electricity market, and to design and construct the plant to operate continuously throughout the year (with allowances for maintenance). Further project objectives include minimizing capital costs, minimizing or avoiding environmental impacts, and maximizing utilization of existing Potrero Power Plant systems (SECAL 2000a, AFC §§ 1.1, 1.7).

ALTERNATIVE GENERATING TECHNOLOGIES

The applicant addresses alternative generating technologies in its application (SECAL 2000a, AFC § 1.7). Other fossil fuel burning power generating facilities such as oil and coal would be less efficient and produce greater emissions than the proposed design for Unit 7. Given the project objectives, location, and air pollution control requirements, staff agrees with the applicant that from the standpoint of efficiency only natural gas-burning technologies are feasible.

NATURAL GAS-BURNING TECHNOLOGIES

Fuel consumption is one of the most important economic factors in selecting an electric generator; fuel typically accounts for over two-thirds of the total operating costs of a fossil-fired power plant. Under a competitive power market system, where operating costs are critical in determining the competitiveness and profitability of a power plant, the plant owner is thus strongly motivated to purchase fuel efficient machinery. Capital cost is also important in selecting generating

machinery. Recent progress in the development of large, stationary gas turbines, aided by the incorporation into these machines of technological advances made in the development of aircraft (jet) engines, has created a situation in which several large manufacturers compete vigorously to sell their machines. This, combined with the cost advantages of assembly-line manufacturing, has driven down the prices of these machines. Thus, the power plant developers can purchase a turbine generator that not only offers the lowest available fuel costs, but at the same time sells for the lowest per-kilowatt capital cost.

Possible alternatives to the GE Frame FA combustion turbine are the Siemens-Westinghouse 501G gas turbine generator and the GE Frame 7H gas turbine generator. Both machines are relatively new with limited applications and therefore the applicant's decision to use the GE Frame FA is considered to be reasonable.

A further choice of alternatives involves the selection of gas turbine inlet air cooling methods. The two commonly used techniques are the evaporative cooler and the refrigeration chiller; both devices increase power output by cooling the gas turbine inlet air. A mechanical chiller can offer greater power output than the evaporative cooler on hot, humid days, but consumes electric power to operate its refrigeration process, thus slightly reducing overall net power output and, thus, overall efficiency. An absorption chiller uses less electric power, but necessitates the use of a substantial inventory of ammonia. An evaporative cooler boosts power output best on dry days; it uses less electric power than a mechanical chiller, possibly yielding slightly higher operating efficiency. The evaporative cooler inlet system does require additional water that must be made up due to evaporation loss and blowdown to maintain water quality. The difference in efficiency among these techniques is relatively insignificant. The applicant proposes to employ evaporative cooling (SECAL 2000a, AFC § 2.2.3.1). Given the climate at the project site and the relative lack of clear superiority of one system over the other, staff agrees that the applicant's approach will yield no significant adverse energy impacts.

In conclusion, the project configuration (two-on-one configuration combined cycle) and generating equipment (F-class gas turbines) with inlet air evaporative cooling, appears to represent the most efficient feasible combination to satisfy the project objectives. There are no alternatives that could significantly reduce energy consumption.

CUMULATIVE IMPACTS

While there are seasonal variations with the supply, delivery, and pricing of natural gas that may affect the regional area of Unit 7, this plant incrementally is not sufficient to be a cause of concern for these issues. When considering other power plant projects located in the San Francisco area, the potential for cumulative energy consumption impacts when aggregated with Unit 7 are not expected to be significant. Staff knows of no other new projects that could result in cumulative energy impacts. Unit 7 will have a higher efficiency than existing plants in the area and, based on its capability to produce more power using less fuel, staff believes that construction and operation of Unit 7 will not bring about indirect impacts, in the form of additional fuel consumption, that would not have occurred but for Unit 7.

California's electric power will be generated by those power plants that bid most successfully to sell their output to the market. Unit 7 will be one of the most fuel efficient power plants in the San Francisco area and even in the US. Since no significantly more efficient power plants are envisioned to compete against Unit 7, no indirect impacts are likely.

FACILITY CLOSURE

Future closure of the facility, whether planned or unplanned, will not influence, nor will it be influenced by, project efficiency. Any efficiency impacts due to closure of the project would be on the electric system as a whole. Yet the vast size of the electric system serving California, the number of generating plants offering to sell power into it, the planned future expansions of generating facilities, and the existence of the California Independent System Operator should ensure the efficient management of the system. With proper planning and management of the electric system, the future closure of this facility should not produce significant adverse impacts on efficiency.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Unit 7, if constructed and operated as proposed, would generate 540 MW of electric power at an overall project fuel efficiency of approximately 56 percent. While it will consume substantial amounts of energy, it will do so in the most efficient manner practicable. It will not create significant adverse effects on energy supplies or resources, will not require additional sources of energy supply, and will not consume energy in a wasteful or inefficient manner. No energy standards apply to the project. Staff therefore concludes that Unit 7 would present no significant adverse impacts upon energy resources.

No cumulative impacts on energy resources are likely. Facility closure would not likely present significant impacts on electric system efficiency.

RECOMMENDATION

No Conditions of Certification are proposed.

REFERENCES

SECAL (Southern Energy California). 2000a. Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, May 31, 2000.

POWER PLANT RELIABILITY

James C. Henneforth

INTRODUCTION

In this analysis, Energy Commission staff addresses the reliability issues of the project to determine if the proposed power plant is likely to be built in accordance with typical industry norms for reliability of power generation. Staff uses this level of reliability as a benchmark because the resulting project would likely not degrade the overall reliability of the electric system it serves (see Setting below).

The scope of this power plant reliability analysis covers:

- equipment availability;
- plant maintainability;
- fuel and water availability; and
- power plant reliability in relation to natural hazards.

Staff examined the project design criteria to determine if the project is likely to be built in accordance with typical industry norms for reliability of power generation. While Mirant Potrero, LLC (Mirant), who would be the owner of the Potrero Power Plant Unit 7 Project (Unit 7), has predicted a level of reliability for the power plant (see below), staff believes Mirant should not be held responsible for achieving this goal, so long as the plant's reliability matches or exceeds that of similar plants.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Presently, there are no laws, ordinances, regulations or standards (LORS) that establish either power plant reliability criteria or procedures for attaining reliable operation. However, the commission must make findings as to the manner in which the project is to be designed, sited and operated to ensure safe and reliable operation (Cal. Code Regs., tit. 20, § 1752(c)). Staff takes the approach that a project is acceptable if it does not degrade the reliability of the utility system to which it is connected. This is likely the case if the project exhibits reliability at least equal to that of other power plants on that system (see Setting below).

SETTING

In the regulated monopoly electric industry of past decades, the utility companies assured overall system reliability, in part, by maintaining a "reserve margin." This amounted to having on call, at all times, sufficient generating capacity, in the form of standby power plants, to quickly handle unexpected outages of generating or transmission facilities. The utilities generally maintained a seven to ten percent reserve margin, meaning that sufficient capacity was on call to quickly replace from seven to ten percent of total system resources. This margin proved adequate, in part because of the reliability of the power plants that constituted the system.

Now, in the newly restructured competitive electric power industry, the responsibility for maintaining system reliability falls largely to the California Independent System Operator (Cal-ISO), an entity that purchases, dispatches and sells electric power throughout the state. How Cal-ISO will ensure system reliability is still being determined; protocols are being developed and put in place that will, it is anticipated, allow sufficient reliability to be maintained under the competitive market system. "Must-run" power purchase agreements and "participating generator" agreements are two mechanisms being employed to ensure an adequate supply of reliable power (Mavis 1998, pers. comm.). As a result of power shortages in California during summer of 2000 and winter of 2001, changes are being made by the Governor and the state legislature to increase and ensure the overall reliability of power generating and distribution systems.

The Cal-ISO also requires those power plants selling ancillary services, as well as those holding reliability must-run contracts, to fulfill certain requirements, including:

- filing periodic reports on plant reliability;
- reporting all outages and their causes; and
- scheduling all planned maintenance outages with the Cal-ISO (Detmers 1999, pers. comm.).

The Cal-ISO's mechanisms to ensure adequate power plant reliability apparently have been devised under the assumption that the individual power plants that compete to sell power into the system will each exhibit a level of reliability similar to that of power plants of past decades. However, there is cause to believe that, under free market competition, financial pressures on power plant owners to minimize capital outlays and maintenance expenditures may act to reduce the reliability of many power plants, both existing and newly constructed. It is possible that, if significant numbers of power plants exhibit individual reliability sufficiently lower than this historical level, the assumptions used by Cal-ISO to ensure system reliability will prove invalid, with potentially disappointing results. Until the restructured competitive electric power system has undergone a shakeout period, and the effects of varying power plant reliability are understood and compensated for, staff deems it wise to encourage power plant owners to continue to build and operate their projects to the level of reliability to which all in the industry are accustomed.

Mirant proposes to operate the 540 MW Unit 7 at base load, selling energy and capacity on the market and via direct bilateral contracts. The plant is expected to achieve an annual average capacity factor of between 75 and 85 percent (SECAL 2000a, AFC §§ 1.1, 1.4). The projected annual availability for the facility is between 92 and 95 percent.

ANALYSIS

A reliable power plant is one that is available when called upon to operate. Throughout its intended life, Unit 7 will be expected to perform reliably in base load and load following mode. Power plant systems must be able to operate for extended periods (sometimes months on end) without shutting down for maintenance or repairs. Achieving this reliability is accomplished by ensuring adequate levels of equipment availability, plant maintainability, fuel and water availability, and resistance to natural hazards. Staff examines these factors for the project and compares them to industry norms. If they compare favorably, staff can conclude that Unit 7 will be as reliable as other power plants on the electric system, and will therefore not degrade system reliability.

EQUIPMENT AVAILABILITY

Equipment availability will be ensured by use of appropriate quality assurance/quality control (QA/QC) programs during design, procurement, construction and operation of the plant, and by providing for adequate maintenance and repair of the equipment and systems (discussed below). The project will maintain a record of documents for review and reference including vendor instruction manuals; design calculations and drawings; quality assurance reports; inspection and equipment testing reports; conformed construction drawings and records; and procurement specifications, purchase orders and project correspondence. During construction the quality assurance program will include inspections of equipment/components, installations, system and component testing, and startup and commissioning (SECAL 2000a, AFC § 2.4.6).

The applicant has identified equipment to be purchased from qualified suppliers, based on technical and commercial evaluations. The applicant has described a quality control program to yield typical reliability of design and construction. To ensure such implementation, staff will propose appropriate conditions of certification under the portion of this document entitled **Facility Design**.

PLANT MAINTAINABILITY

EQUIPMENT REDUNDANCY

A generating facility called on to operate in base load service for long periods of time must be capable of being maintained while operating. A typical approach for achieving this is to provide redundant examples of those pieces of equipment most likely to require service or repair. Mirant plans to provide appropriate redundancy of function for the combined cycle portion of the project (SECAL 2000a, AFC § 2.4.3). The fact that the project consists of two trains of gas turbine generators and heat recovery steam generators (HRSG) that supply steam to the steam turbine provide inherent reliability. Failure of a non-redundant component of one train should not cause the other train to fail, thus allowing the plant to continue to generate (though at reduced output). Further, the plant's distributed control system (DCS) will be built with typical redundancy. Other balance of plant equipment will be provided with redundant examples, thus:

- two 50 percent boiler feed pumps per train;
- two 100 percent condensate pumps;
- two 50 percent circulating water pumps;
- separate main transformers for each CTG and STG;
- three 100 percent air compressors;
- three 50 percent fuel gas compressors.

Additionally, there will be a steam bypass system that will allow for the gas turbines to operate at full load in the event of a steam turbine outage (SECAL 2000a, AFC Table 2-19). With this opportunity for continued operation in the face of equipment failure, staff believes that equipment redundancy will be sufficient for a project such as this.

MAINTENANCE PROGRAM

Mirant proposes to establish a plant maintenance program typical of the industry (SECAL 2000a, AFC §2.4.1). Equipment manufacturers provide maintenance recommendations with their products; the applicant will base its maintenance program on these recommendations. For example, each gas turbine will be scheduled for a week to 10 days per year off-line (at times of low electricity demand) in order to perform annual inspections and cleaning. Every third year, each gas turbine will undergo a hot gas path inspection lasting up to three weeks. Every sixth year, each gas turbine will undergo a major maintenance turnaround that typically lasts at least four weeks. In light of these plans, staff expects that the project will be adequately maintained to ensure acceptable reliability.

FUEL AND WATER AVAILABILITY

For any power plant, the long-term availability of fuel and of water for cooling or process use is necessary to ensure reliability. The need for reliable sources of fuel and water is obvious; lacking long-term availability of either source, the service life of the plant may be curtailed, threatening the supply of power as well as the economic viability of the plant.

FUEL AVAILABILITY

Unit 7 will burn natural gas from the Pacific Gas and Electric (PG&E) system. Fuel availability is a function of both having sufficient resource and pipeline transportation capacity for delivery to the plant. The PG&E natural gas system has access to gas from the Rocky Mountains, Canada and the Southwest. This represents a resource of considerable capacity. This system offers access to far more gas than the plant would require. Therefore, fuel gas availability does not appear to be a concern for the project. The applicant proposes that gas be transmitted to the plant via an existing pipeline that is currently used to provide gas to the existing units at the site. The AFC describes that the proposed

interconnection for Unit 7 will be made to the existing pipeline consisting of valves and pressure control and metering equipment (SECAL 2000a, AFC § 2.2.5.1). Staff has concerns that with the existing plant at Hunters Point, the planned 500 MW Golden Gate Power Project, the existing Potrero Unit 3 and Unit 7 all operating simultaneously, that there will be sufficient pipeline capacity in the area to meet these needs. On April 12, 2001 Mirant submitted to Pacific Gas and Electric Company a "Formal Application for Modified Gas Service At Potrero Power Plant" (Mirant 2001a). PG&E will perform a study to determine the specific requirements and system modifications necessary to supply sufficient fuel gas to the project. However, PG&E has indicated that it is a possibility that an addition of 8,000 feet of new gas pipeline taking 9 to 12 months to install may be required. Staff agrees with the applicant's prediction that there will be adequate natural gas supply, however considering other planned and existing projects in the area additional pipeline capacity may be required to meet the project's needs.

WATER SUPPLY RELIABILITY

There will be two sources of water for the project. Water for cooling purposes will be supplied from the San Francisco Bay. The City of San Francisco will provide water for potable, process, and sanitary uses. Staff believes that these sources yield sufficient likelihood of reliable supplies of water. (For further discussion of water supply, see that portion of this document entitled **Water Resources**.)

POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. Application of LORS in the design of the power plant will provide mitigations for events of high winds, which will not likely represent a hazard for this project, but flooding and seismic shaking (earthquake) present credible threats to reliable operation (see those portions of this document entitled **Facility Design** and **Geology and Paleontology**).

FLOODING

No natural streams or rivers are in the vicinity of the Unit 7 site and flooding has not been a problem for the existing facilities. Stormwater is channeled into storm drains due to the extensive urbanization in the site area. The project site is located at an elevation of 33.6 feet National Geodetic Vertical Datum (NGVD). Based on the Army Corps of Engineers Tidal Stage vs. Frequency Study (1984), the 100-year tide level in the area was 6.7 feet NGVD. The calculated maximum runup including 100-year tide, wind, and mean higher high water tide level is 13.0 feet NGVD. Because of its location, the San Francisco Energy Company has reported it in 1994 that a tsunami entering San Francisco Bay has the potential to cause runup at Potrero. If the 100-year tsunami occurred at the same time as the 100-year storm, the total runup would be 18.5 feet NGVD. Staff believes that there is no special concern with the power plant functional reliability affecting the electric system's reliability due to flooding events (SECAL 2000a, AFC § 8.14.1.3).

SEISMIC SHAKING

The site lies within Seismic Risk Zone 4 (SECAL 2000a, AFC § 2.3.1.1); see that portion of this document entitled **Geology and Paleontology**. The project will be designed and constructed to the latest appropriate LORS. Compliance with current LORS applicable to seismic design represents an upgrading of performance during seismic shaking, compared to older facilities, due to the fact that these LORS have been periodically and continually upgraded. By virtue of being built to the latest seismic design LORS, this project will likely perform at least as well as, and perhaps better than, existing plants in the electric power system. Staff has proposed conditions of certification to ensure this; see that portion of this document entitled **Facility Design**. In light of the historical performance of California power plants and the electrical system in seismic events, staff believes there is no special concern with power plant functional reliability affecting the electric system's reliability due to seismic events.

COMPARISON WITH EXISTING FACILITIES

The North American Electric Reliability Council (NERC) keeps industry statistics for availability factors (as well as many other related reliability data). NERC continually polls utility companies throughout the North American continent on project reliability data through its Generating Availability Data System (GADS), and periodically summarizes and publishes the statistics on the Internet (<http://www.nerc.com>). NERC reports the following summary generating unit statistics for the years 1994 through 1998 (NERC 1999):

For Combined Cycle units (All MW sizes)
Availability Factor = 91.49 percent

The equivalent classes of gas turbines that will be employed in the project have been on the market for several years now, and can be expected to exhibit typically high availability. The applicant's prediction of an annual availability factor of between 92 and 95 percent (SECAL 2000a, AFC § 2.4.1) appears reasonable compared to the NERC figure for similar plants throughout North America (see above). In fact, these new, large machines can well be expected to outperform the fleet of various (mostly older and smaller) gas turbines that make up the NERC statistics. Further, since the plant will consist of two parallel gas turbine generating trains, maintenance can be scheduled during those times of year when the full plant output is not required to meet market demand, typical of industry standard maintenance procedures. The applicant's estimate of plant availability therefore appears realistic. The stated procedures for assuring design, procurement and construction of a reliable power plant appear to be in keeping with industry norms, and staff believes they are likely to yield an adequately reliable plant.

FACILITY CLOSURE

Closure of the facility, whether planned or unplanned, cannot impact project reliability. Reliability impacts on the electric system from facility closure, should

there be any, are dealt with in that portion of this document entitled **Transmission System Engineering**.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Unit 7 will consist of a combined cycle plant with a two combustion turbine and one steam turbine configuration. Equipment technology will apply commercially proven designs with redundancy of critical components. Fuel is available from Pacific Gas and Electric Company, although expansion of their gas pipeline system may be required for delivery, and water supply from the San Francisco Bay for cooling purposes and the City of San Francisco for potable and process uses is adequate.

The applicant predicts an equivalent availability factor between 92 and 95 percent using the newest commercially proven equipment, which staff believes is achievable in light of the industry norm of 91 percent for all types of similar plants. Based on a review of the proposal, staff concludes that the plant will be built and operated in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability.

RECOMMENDATION

Pending confirmation that PG&E will provide sufficient fuel gas pipeline capacity to service the plant, staff concludes that the proposed power plant can be expected to operate reliability. No conditions of certification are proposed.

REFERENCES

SECAL (Southern Energy California), 2000a. Application for certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, May 31, 2000.

Detmers, Jim. 1999. Director of Maintenance and Reliability, California Independent System Operator. Interview with Steve Baker (California Energy Commission), July 13, 1999.

Mavis, Steve. 1998. Transmission Planner, California Independent System Operator. Telephone conversation with Steve Baker (California Energy Commission), January 23, 1998.

Mirant (Mirant Corporation). 2001 a. Letter to Michael D. O'Brien, Pacific Gas & Electric Company, April 12, 2001.

TRANSMISSION SYSTEM ENGINEERING

Mark Hesters and Al McCuen

INTRODUCTION

The Transmission System Engineering (TSE) analysis of the Preliminary Staff Assessment (PSA) provides some of the basis for the findings in the Energy Commission's decision. The TSE analysis indicates whether or not the transmission facilities associated with the proposed project conform to all applicable laws, ordinances, regulations and standards (LORS) required for safe and reliable electric power transmission.

The applicant, Mirant Potrero, LLC (Mirant) proposes to install the Potrero Power Plant Unit 7 Project (Unit 7), a new combined-cycle generating facility, within the fenceline of the existing Potrero power plant currently owned by Mirant Corporation. Mirant proposes to interconnect the generating facility to the electrical grid through Pacific Gas and Electric Company's (PG&E) Potrero and Hunters Point 115 kV substations. The California Independent System Operator (Cal-ISO) is responsible for ensuring electric system reliability for all participating transmission owning utilities, and determines both the standards necessary to achieve reliability and whether the proposed project conforms to those standards. The Energy Commission will rely on the Cal-ISO's determinations to make its findings related to applicable reliability standards, the need for additional transmission facilities, and environmental review of the whole of the project. In this case, staff is primarily a facilitator, coordinating the Cal-ISO's process and results with the certification process and the Energy Commission decision. The Cal-ISO will provide testimony at the Energy Commission's hearings.

Staff's analysis also evaluates the power plant switchyard, outlet line, termination facilities and outlet alternatives identified by the applicant, and provides proposed conditions of certification to ensure that the project complies with applicable LORS during the design, construction, operation and closure of the project.

Public Resources Code, section 25523 requires the Energy Commission to "prepare a written decision...which includes: ...findings regarding conformity of the proposed site and related facilities...with public safety standards...and with other relevant local, regional, state, and federal standards, ordinances, and laws." Under the California Environmental Quality Act (CEQA) the Energy Commission must conduct an environmental review of the "whole of the action," which may include facilities not licensed by the Energy Commission (Title 14, California Code of Regulations, §15378). Therefore, the Energy Commission must identify and evaluate the environmental effect of construction and operation of any new or modified transmission facilities beyond the project's interconnection with the existing transmission system that are required as a result of the power plant addition to the California transmission system.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

- California Public Utilities Commission (CPUC) General Order 95 (GO-95), “Rules for Overhead Electric Line Construction”, formulates uniform requirements for construction of overhead lines. Compliance with this order ensures adequate service and safety to persons engaged in the construction, maintenance, operation or use of overhead electric lines and to the public in general.
- CPUC Rule 21 provides standards for the reliable connection of parallel generating stations connected to participating transmission owners.
- Western Systems Coordinating Council (WSCC) Reliability Criteria provides the performance standards used in assessing the reliability of the interconnected system. These Reliability Criteria require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. The WSCC Reliability Criteria includes the Reliability Criteria for Transmission System Planning, Power Supply Design Criteria, and Minimum Operating Reliability Criteria. Analysis of the WSCC system is based to a large degree on WSCC Section 4 “Criteria for Transmission System Contingency Performance” which requires that the results of power flow and stability simulations verify established performance levels. Performance levels are defined by specifying the allowable variations in voltage, frequency and loading that may occur on systems other than the one in which a disturbance originated. Levels of performance range from no significant adverse effect outside a system area during a minor disturbance (loss of load or facility loading outside emergency limits) to a performance level that only seeks to prevent system cascading and the subsequent blackout of islanded areas. While controlled loss of generation, load, or system separation is permitted in extreme circumstances, their uncontrolled loss is not permitted (WSCC 1998).
- North American Electric Reliability Council (NERC) Planning Standards provide policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC’s Criteria for Transmission System Contingency Performance. The NERC planning standards provide for acceptable system performance under normal and contingency conditions, however the NERC planning standards apply not only to interconnected system operation but also to individual service areas (NERC 1998).
- Cal-ISO’s Reliability Criteria also provide policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC’s Criteria for Transmission System Contingency Performance and the NERC Planning Standards. The Cal-ISO Reliability Criteria incorporate the WSCC Criteria and NERC Planning Standards. However, the Cal-ISO Reliability Criteria also provide some additional requirements that are not found in the WSCC Criteria or the NERC Planning

Standards. The Cal-ISO Reliability Criteria apply to all existing and proposed facilities interconnecting to the Cal-ISO controlled grid.

- Cal-ISO Scheduling Protocols and Dispatch Protocols require conformance with NERC, WSCC, and Local Area Reliability and Planning Criteria. These standards will be applied to the assessment of the system reliability implications of the Unit 7 project. Also of major importance to projects are the Cal-ISO Day/Hour Ahead Inter-zonal Congestion Management Scheduling Protocol (SP 10), the Transmission System Loss Management Scheduling Protocol (SP 4), and the Creation of the Real Time Merit Order Stack (SP 11). The Congestion Management Scheduling Protocol provides that the operation of power plants not violate system criteria when market participants request generation dispatch or the use of major interties. The Real Time Merit Order Stack is developed based on increasing energy bid prices so that the least cost bids are accepted early on and if congestion is anticipated the highest bids are not selected. The Transmission System Loss Management Scheduling Protocol uses the Cal-ISO power flow model to identify total transmission losses at each generating unit and scheduling point. Additional calculations are performed to determine the actual net power output required by the generating units to meet their scheduled obligations. (Cal-ISO 1998a, Cal-ISO 1998b).
- Cal-ISO Participating Generator Agreement consists of detailed explanations of the requirements in the Cal-ISO Tariff pertaining to the paralleled generating unit.

PROJECT DESCRIPTION

Mirant's Unit 7 is nominally rated at 540 MW and will produce a maximum of 615 MW. Unit 7 will connect to a new, double bus switchyard and from there to PG&E's electric transmission network. The new switchyard will connect to PG&E's Potrero substation, adjacent to the new switchyard, and to the Hunters Point substation via a new underground double-circuit 115 kV transmission line.

POWER PLANT SWITCHYARD

The new power plant will consist of three generators, two combustion turbines and one steam generator. Each generator will have a dedicated oil-filled, delta-wye 18 kV to 115 kV step-up transformer. The high voltage side of the transformers will connect to the new Potrero Power Plant switchyard with bundled 2300 KCM aluminum line (SECAL 2000a, AFC page 2-21). This configuration is acceptable.

The new Potrero switchyard will be a double-bus switchyard. The double-bus configuration means the switchyard can be (and will be operated) as two separate busses. The switchyard will be constructed in a ring-bus formation with breakers that, when open, disconnect the two sides of the ring. The existing Potrero generating units, 3 through 6 and one of the new Unit 7 combustion turbines will connect to one side of the bus while the other new combustion turbine and the new steam generator of Unit 7 will connect to the other (SECAL 2000a, AFC page 2-22). This configuration for the double-bus switchyard is acceptable.

TRANSMISSION LINE

The Potrero Power Plant switchyard will connect to the PG&E electrical network through two new transmission lines. One line will connect to the Potrero substation adjacent to the switchyard and the other will connect to the Hunters Point substation via a new 1.8 mile 115 kV underground line. Output from the existing units 3 through 6 and one new gas turbine will go to the Potrero substation while the rest of the output from Unit 7 will be connected to the Hunters Point substation (SECAL 2000a, AFC pages 2-22 and 2-23).

To connect the Potrero switchyard to the Potrero substation, Mirant will use two 115 kV bundled circuits of 2300-KCM all-aluminum conductors (AAC). Existing towers will be modified to accommodate the new conductors (SECAL 2000a, AFC page 2-23).

To connect the Potrero Power Plant switchyard to the Hunters Point substation Mirant will use two new 115 kV 3-phase circuits of 2,300 KCM XLPE solid dielectric underground cables. The cables will be buried in a trench six-feet deep and six-feet wide under the streets and in two thirty-inch pipes twenty to thirty feet below the bed of Islais Creek (SECAL 2000a, AFC figures 2-12 and 2-13). Mirant proposes to route this approximately 1.8 mile transmission line from the new Potrero switchyard south down Illinois Avenue, across Islais Creek, down Cargo Avenue, up Jennings Avenue and into the Hunters Point substation. In order to accommodate the new transmission line from Potrero, the Hunters Point substation will require two new interconnection bays, which will extend the bus from a six-position ring bus to an eight-position ring bus (SECAL 2000a, AFC page 2-23). The underground cable must comply with CPUC General Order 128. This configuration is acceptable.

EXISTING FACILITIES AND RELATED SYSTEMS

Mirant proposes to locate the Unit 7 project adjacent to the existing Potrero Power Plant in the City and County of San Francisco (CCSF). The CCSF is located in the PG&E service territory and is served by a radial transmission network and three local power plants. An analysis of the long-term transmission needs of the San Francisco/ Peninsula corridor has shown that PG&E would not be able to meet NERC standards in 2006 without constructing a new 230 kV transmission line; however, a new power plant in San Francisco may defer or replace the transmission line (Cal-ISO 2001b, pages 2-4).

The electricity needs of the San Francisco and the Peninsula are served by local generators and several transmission lines that import power. Locally, the Hunters Point Power Plant, Potrero Power Plant and United Cogeneration Plant provide power to loads in the CCSF and Peninsula. Six overhead and one underground transmission line currently tie the CCSF to the rest of PG&E's network. These lines and power plants currently provide all the electricity for the CCSF. According to a study recently completed by PG&E and the Cal-ISO, the San Francisco/Peninsula area will not meet Cal-ISO reliability standards without significant transmission or generation additions. PG&E has started the permitting phase for a new 230 kV transmission line between the San Mateo and Martin substations to insure that the

line is available by 2006. New generation in San Francisco could defer the need for the new San Mateo-Martin 230 kV line.

ANALYSIS

SYSTEM RELIABILITY

INTRODUCTION

Mirant provided a preliminary interconnection study in their AFC (SECAL 2000a, AFC Appendix C). Mirant has since requested a Detailed Facility Study (DFS) from PG&E and the new study should be complete by August 2001. The DFS will determine the effects of connecting a new power plant to the existing electric grid and will identify the potential impacts and the proposed mitigating measures. The results of the DFS will not be available in time to include in the Final Staff Assessment or Staff testimony but the preliminary interconnection in conjunction with the Cal-ISO preliminary approval is sufficient. Any new transmission facilities such as the power plant switchyard, the outlet line, and downstream facilities¹ required for connecting a project to the grid, are considered part of the project and are subjected to the full AFC review process. Based on the results of the preliminary interconnection study, connecting the full output from Unit 7 to the Potrero substation will result in significant line overloads under normal conditions. The proposed two-circuit cable from the Potrero switchyard to the Hunters Point substation, or something similar, is required to mitigate these overloads.

PRELIMINARY FACILITIES STUDY SUMMARY

The Preliminary Facility Study which analyzed the effects of Unit 7 on the transmission interconnection and system, included the following scope:

- **Steady State Power Flow Study:** These studies were conducted using PG&E's 2004 Summer peak power flow case with a one-in-ten year summer peak load in the study area. A 2004 Summer Partial peak base case was studied by modeling loads at 75% of those in the peak load study. The study analyzed adverse impacts to normal operating conditions. Further studies were conducted taking single and multiple lines out of service for contingency analysis.
- **Dynamic Stability Study:** Dynamic facility studies were not performed for the preliminary study but will be performed for the DFS.
- **System Protection Study:** The preliminary study did not analyze short-circuit fault duty, which will also be included in the DFS.

¹ Downstream facilities are those that are beyond the point where the line emanating from the power plant joins with the (existing) interconnected system. (California Public Utilities Commission v. California Energy Resources Conservation and Development Commission (1984) 150 Cal. App 3d 437, [197 Cal. Rptr. 866].

As with all system studies, various assumptions were made and listed in the preliminary study (SECAL 2000a, AFC Appendix C). The preliminary study is intended to analyze the Unit 7 project, as well as other proposed generation projects, and to determine the impacts on the transmission grid. The study provides the basis for determining any system modifications or Remedial Action Schemes (RAS) necessary to approve the interconnection of the generation to the electrical transmission grid. Conclusions drawn from the preliminary study are highlighted below:

1. Steady State and Contingency Power Flow Study:
 - a. The impact of Unit 7 was analyzed with and without the proposed Potrero-Hunters Point 115 kV underground line. Without the underground line several transmission lines overloaded under normal conditions. There are no overloads with the addition of the Potrero-Hunters Point 115 kV underground line.
 - b. A RAS will be required to mitigate 115 kV overloads during contingencies. The specific requirements of the RAS will be determined in the Detailed Facilities Study.
2. Dynamic Stability Study:
 - a. A Dynamic Stability Study was not performed for the preliminary interconnection study. However, violations identified in a Dynamic Stability Study are usually mitigated with RAS and do not require downstream facilities.
3. System Protection Study:
 - a. A System Protection Study was not performed in the preliminary interconnection study. However the System Protection Study analyzes the fault duty of circuit breakers and as mitigation requires the replacement of existing breakers with higher rated breakers. The upgrade of circuit breakers usually occurs within the fence line of existing substations and therefore does not engender significant environmental impacts.

CAL-ISO SUMMARY

On February 21, 2001, the Cal-ISO issued a preliminary approval to connect the Mirant Unit 7 to the PG&E network through the Potrero and Hunters Point substations (Cal-ISO 2001a, page 3). The Cal-ISO will grant final approval for interconnection based on the results of the Detailed Facility Study. Staff anticipates that the DFS will not be available prior to the final staff assessment.

STUDY CONCLUSIONS

The Preliminary Facility Study indicates that there are no major adverse transmission impacts with the proposed interconnection of the Unit 7. Minor overloads identified through single contingency analysis may be mitigated with generation curtailment or RAS. Dynamic stability and short circuit duty studies will be completed in the Detailed Facility Study and will not identify the need for significant downstream facilities.

Staff concludes that the proposed Unit 7 will have no adverse transmission impacts and could be approved with the proposed Staff conditions to ensure adequate design and installation of the facilities proposed. Final approval by the Cal-ISO will not be granted until a full review of the DFS is completed. The Condition of Certification, TSE-1e, provides for Commission review of this information. Based on the Preliminary Facility Study, the interconnection of Unit 7, with the proposed two-circuit line between Potrero and Hunters Point, will require no additional, significant transmission facilities.

TRANSMISSION ALTERNATIVES

In addition to construction of Unit 7 and a new switchyard adjacent to the Potrero Power Plant, the project also includes the proposed construction of a 1.8-mile single circuit 115 kV transmission line to the Hunters Point Substation. Mirant proposed the connection of the Potrero Power Plant Switchyard to the Hunters Point substation to avoid transmission line overloads. Alternatives to the proposed interconnection need to avoid or eliminate transmission line overloads. In the AFC Mirant considered one alternative route for the underground 115 kV line to the Hunters Point Substation and two interconnection alternatives. In consultations with staff, PG&E suggested several other interconnection alternatives.

TRANSMISSION LINE ROUTE ALTERNATIVES

Mirant considered an alternative transmission route for the underground cable to the Hunters Point substation that went up 23rd Street to 3rd Street and from there to Evan's street (SECAL 2000a, AFC page 9-13). According to the AFC this alternative has significant drawbacks due to higher traffic flows on the surface streets which would be disrupted during construction and because these streets already have significant underground utilities. The CCSF supports the alternative transmission line route if this route could be constructed concurrent with construction of the Muni light rail line along 3rd Street. In this manner, the construction impacts could be consolidated and disruption would be minimized. However, the Muni construction is currently scheduled to begin before the proposed Unit 7 project would be approved.

INTERCONNECTION ALTERNATIVES

Mirant also considered interconnecting Unit 7 to the Mission or Larkin substations instead of the Hunters Point substation. However, while these options eliminated transmission line overloads, they were inferior to the preferred Hunters Point interconnection because the Mission and Larkin substations are both indoors and have significantly less space than the Hunters Point substation (SECAL 2000a, AFC page C-3).

According to PG&E there may be other interconnection alternatives (January 26, 2001 letter to Marc Pryor, Energy Commission). The Potrero Substation is currently connected to the Bayshore Substation (located at 155 Bayshore Boulevard, about 1.6 miles away) with two 115 kV cables, to the Mission Substation (at 66 8th Street, about 2.7 miles away) with one 115 kV cable and to the Larkin Substation. PG&E stated that it "may be plausible" to tap in to the existing 115 kV

cables and re-arrange termination points (as opposed to running new 115 kV cables to an existing substation). However, PG&E stated that extensive and complex engineering analysis would be required to determine the viability of such options.

CUMULATIVE IMPACTS

The operation of Unit 7 in conjunction with existing and anticipated generation projects in California will have no significant negative cumulative impacts. Unit 7's proposed location in the City and County of San Francisco (CCSF) places the project in a significant load center. Thus, the electricity produced by Unit 7 will primarily serve local electricity needs and will not impact the rest of California's transmission network. One other project, the 570 MW Golden Gate Power Phase II Project (GGPP-II) is currently proposed in the CCSF area. Electricity produced by the GGPP-II and Unit 7 projects will serve local loads in the Greater Bay Area, and will not have significant cumulative impacts on the transmission network. Because these projects will provide power locally, their operation will not significantly impact transmission systems outside the San Francisco/Peninsula transmission corridor.

FACILITY CLOSURE

PLANNED CLOSURE

This type of closure occurs in a planned and orderly manner such as at the end of its useful economic or mechanical life or due to gradual obsolescence. Under such circumstances, the owner is required to provide a closure plan 12 months prior to closure, which in conjunction with applicable LORS, is considered sufficient to provide adequately for safety and reliability. For instance, a planned closure provides time for the owner to coordinate with the PTO to assure (as one example) that the PTO's system will not be closed into the outlet thus energizing the project substation. Alternatively, the owner may coordinate with the PTO to maintain some power service via the outlet line to supply critical station service equipment or other loads.²

UNEXPECTED TEMPORARY CLOSURE

An unplanned closure occurs when the facility is closed suddenly and/or unexpectedly for a short term due to unforeseen circumstances such as a natural or other disaster or emergency. During such a closure the facility cannot insert power into the utility system. Closures of this sort can be accommodated by establishing an on-site contingency plan (see **General Conditions Including Compliance Monitoring and Closure Plan**).

UNEXPECTED PERMANENT CLOSURE

This unplanned closure occurs when the project owner abandons the facility. This is considered to be a permanent closure. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It

² These are mere examples, many more exist.

can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. An on-site contingency plan, that is in place and approved by the Energy Commission's Compliance Project Manager (CPM) prior to the beginning of commercial operation of the facilities, will be developed to assure safety and reliability (see **General Conditions Including Compliance Monitoring and Closure Plan**).

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

- Staff's preliminary findings indicate that no significant additional new transmission facilities, other than those proposed by the applicant, are required for the interconnection of the Unit 7 project to meet NERC, WSCC, and Cal-ISO reliability criteria.
- The Cal-ISO has provided preliminary approval of the Unit 7 interconnection, and has identified additional studies required to grant final approval of the project.
- The power plant switchyard, outlet lines, and termination are acceptable and will comply with LORS assuming the conditions of certification are implemented.
- The issuance of the Cal-ISO's final interconnection approval will assure conformance with NERC, WSCC and Cal-ISO reliability criteria. Conditions of Certification TSE-1e and TSE-1f provide for Energy Commission review of the Cal-ISO's final interconnection approval letter and the PG&E/applicant Facility Interconnection Agreement.

RECOMMENDATIONS

Staff proposes the following conditions of certification to insure system reliability and conformance with LORS.

CONDITIONS OF CERTIFICATION

TSE-1 The project owner shall furnish to the CPM and to the CBO a schedule of facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Verification: At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major structures and

equipment in **Table 1: Major Equipment and Structure List** below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1: Major Equipment and Structure List

QTY	DESCRIPTION	SIZE/CAPACITY	COMMENTS
	Breakers	Voltage, Amps	
	Step-up transformer	kV	
	Switchyard		
	Busses		
	Surge Arrestors		
	Disconnects		
	Take off facilities		
	Electrical Control Building		
	Switchyard control building		
	Transmission Pole/Tower		
	Other		

⁽¹⁾ All sizes and capacities are approximate and may change during final design.

TSE-2 Prior to the start of construction the project owner shall assign an electrical engineer and at least one of each of the following to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; or D) a mechanical engineer. [California Business and Professions Code section 6704 et seq., and sections 6730 and 6736 requires state registration to practice as a civil engineer or structural engineer in California.]

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The civil, geotechnical or civil and design engineer assigned in conformance with Facility Design condition **GEN-5**, may be responsible for design and review of the TSE facilities.

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all engineers assigned to the project. If any one of the designated engineers is

subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer. This engineer shall be authorized to halt earthwork and to require changes; if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations.

The electrical engineer shall:

1. Be responsible for the electrical design of the power plant switchyard, outlet and termination facilities; and
2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

TSE-3 The project owner shall keep the CBO informed regarding the status of engineering design and construction. If any discrepancy in design and/or construction is discovered, the project owner shall document the discrepancy and recommend the corrective action required. The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this condition of certification.

Verification: The project owner shall submit monthly construction progress reports to the CBO and CPM to be included in response to **GEN-7**. The project owner shall transmit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

TSE-4 For the power plant switchyard, outlet line and termination, the project owner shall not begin any increment of construction until plans for that increment have been approved by the CBO. These

plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. The following activities shall be reported in the Monthly Compliance Report:

- a) receipt or delay of major electrical equipment;
- b) testing or energization of major electrical equipment; and
- c) the number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for equipment and systems of the power plant switchyard, outlet line and termination, including a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

TSE-5 The project owner shall ensure that the design, construction and operation of the proposed transmission facilities will conform to all applicable LORS, including the requirements listed below. The substitution of Compliance Project Manager (CPM) and CBO approved “equivalent” equipment and equivalent substation configurations is acceptable. The project owner shall submit the required number of copies of the design drawings and calculations as determined by the CBO.

- a) The power plant switchyard and outlet line shall meet or exceed the electrical, mechanical, civil and structural requirements of CPUC General Order 95, CPUC General Order 128 or National Electric Safety Code (NESC), Title 8 of the California Code and Regulations (Title 8), Articles 35, 36 and 37 of the “High Voltage Electric Safety Orders”, National Electric Safety Code (NEC) and related industry standards.
- b) Breakers and busses in the power plan switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.
- c) Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner’s standards.
- d) Termination facilities shall comply with CPUC Rule 21 and applicable interconnection standards (Pacific Gas and Electric).
- e) The project conductors shall be sized to accommodate the full output from the 615 MW plant.
- f) The project owner shall provide:

- i) The final Detailed Facility Study (DFS) including a description of facility upgrades, operational mitigation measures, and/or Remedial Action Scheme (RAS) sequencing and timing if applicable,
- ii) Executed Facility Interconnection Agreement.

Verification: At least 60 days prior to the start of construction of transmission facilities, the project owner shall submit to the CBO for approval:

- a) Design drawings, specifications and calculations conforming with CPUC General Order 95, CPUC General Order 128 or NESC, Title 8, Articles 35, 36 and 37 of the “High Voltage Electric Safety Orders”, NEC, CPUC Rule 21, applicable interconnection standards and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, grounding systems and major switchyard equipment.
- b) For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on “worst case conditions”³ and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95, CPUC General Order 128 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, “High Voltage Electric Safety Orders”, NEC, CPUC Rule 21, applicable interconnection standards, and related industry standards.
- c) Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements **TSE-5** a) through f) above.
- d) The Facilities Study and signed letter from the applicant stating that mitigation is acceptable shall be provided concurrently to the CPM and CBO. Substitution of equipment and substation configurations shall be identified and justified by the project owner for CBO approval.

TSE-6 The project owner shall inform the CPM and CBO of any impending changes, which may not conform to the requirements **TSE-5** a) through f), and have not received CPM and CBO approval, and request approval to implement such changes. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment or substation configurations shall not begin without prior written approval of the changes by the CBO and the CPM.

Verification: At least 60 days prior to the construction of transmission facilities, the project owner shall inform the CBO and the CPM of any impending changes

³ Worst case conditions for the foundations would include for instance, a dead-end or angle pole.

which may not conform to requirements of **TSE-5** and request approval to implement such changes.

TSE-7 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95, CPUC General Order 128 or NESC, Title 8, CCR, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", applicable interconnection standards, NEC and related industry standards. In case of non-conformance, the project owner shall inform the CPM and CBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM and CBO:

- a) "As built" engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95, CPUC General Order 128 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", CPUC GO-21, and applicable interconnection standards, NEC, related industry standards, and these conditions shall be provided concurrently.
- b) An "as built" engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. "As built" drawings of the mechanical, structural, and civil portion of the transmission facilities shall be maintained at the power plant and made available, if requested, for CPM audit as set forth in the "Compliance Monitoring Plan".
- c) A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in responsible charge.

REFERENCES

WSCC (Western Systems Coordinating Council) 1997. Reliability Criteria, August 1998.

SECAL (Southern Energy California). 2000a. Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, May 31, 2000.

SECAL (Southern Energy California). SEP2000DResp1. Southern Energy California response to staff Data Requests, Set 1, Nos. 1 through 139, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission on December 7, 2000.

Cal-ISO (California Independent System Operator). Cal-ISO 2001a, Cal-ISO Comments on the Preliminary Interconnection Study for Mirant California, LLC, Potrero Unit 7 Project. Dated February 23, 2001.

Cal-ISO (California Independent System Operator). 1998a. Cal-ISO Tariff Scheduling Protocol posted April 1998, Amendments 1,4,5,6, and 7 incorporated.

Cal-ISO (California Independent System Operator). 1998b. Cal-ISO Dispatch Protocol posted April 1998.

Cal-ISO (California Independent System Operator). Cal-ISO 2001b. Cal-ISO response to SAEJ inquiries regarding the HPPP. Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to California Energy Commission May 16, 2001.

DEFINITION OF TERMS

AAC	All Aluminum conductor.
Ampacity	Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations.
Ampere	The unit of current flowing in a conductor.
Bundled	Two wires, 18 inches apart.
Bus	Conductors that serve as a common connection for two or more circuits.
Conductor	The part of the transmission line (the wire) which carries the current.
Congestion Management	Congestion management is a scheduling protocol, which provides that dispatched generation and transmission loading (imports), will not violate criteria.
Emergency Overload	See Single Contingency. This is also called an L-1.
Kcmil or kcm	Thousand circular mil. A unit of the conductor's cross sectional area, when divided by 1,273, the area in square inches is obtained.
Kilovolt (kV)	A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground.
Loop	An electrical cul de sac. A transmission configuration which interrupts an existing circuit, diverts it to another connection and returns it back to the interrupted circuit, thus forming a loop or cul de sac.
Megavar	One megavolt ampere reactive.
Megavars	Mega-volt-Ampere-Reactive. One million Volt-Ampere-Reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.

Megavolt ampere (MVA)

A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000.

Megawatt (MW)

A unit of power equivalent to 1,341 horsepower.

Multiple Contingencies

A condition that occurs when more than one major transmission element (circuit, transformer, circuit breaker, etc.) or more than one generator is out of service

Normal Operation/ Normal Overload

When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.

N-1 Condition

See Single Contingency.

Outlet

Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation facilities to the main grid.

Power Flow Analysis

A power flow analysis is a forward looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers and other equipment and system voltage levels.

Reactive Power

Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system.

Remedial Action Scheme (RAS)

A remedial action scheme is an automatic control provision, which, for instance, will trip a selected generating unit upon a circuit overload.

SF6

Sulfur hexafluoride is an insulating medium.

Single Contingency

Also known as emergency or N-1 condition, occurs when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service.

Solid dielectric cable

Copper or aluminum conductors that are insulated by solid polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket.

Switchyard A power plant switchyard (switchyard) is an integral part of a power plant and is used as an outlet for one or more electric generators.

Thermal rating
See ampacity.

TSE Transmission System Engineering.

Undercrossing
A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.

Underbuild
A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

ALTERNATIVES

Susan V. Lee

INTRODUCTION

The purpose of staff's alternatives analysis is to assess alternatives that could feasibly attain the applicant's (Mirant) proposed Potrero Power Plant Unit 7 Project (Unit 7) objectives and avoid or substantially lessen one or more of the significant effects of the project. The analysis also identifies and compares the impacts of the various alternatives but in less detail than the proposed project. The Commission cannot require the plant to be moved to another location. And, if the applicant proposes a project at one of the alternative sites, a new Application for Certification must be filed on that site and a new review process would ensue.

CONCLUSIONS

At this time, potential unmitigable impacts of the proposed project have been identified in (1) cultural resources (demolition of historic building) and (2) biological resources (permanent loss of Bay habitat from construction of the cooling water intake, and impingement and entrainment from the intake of Bay water for the cooling water). All site alternatives would have similar potential to affect Bay habitat and aquatic species, since all could use Bay water for once through cooling. This impact could be eliminated for the proposed project or any alternative site with the use of dry cooling. There are no historic buildings on any of the alternative sites. Aside from the marine biological impacts, which could affect all sites similarly, two alternative sites (ALT-D and ALT-E) may have fewer or less severe impacts overall.

APPROACH

The Energy Commission is the permitting agency and "lead agency" for large thermal power plants. It provides an environmental assessment of proposed projects pursuant to a regulatory program certified by the Secretary of Resources pursuant to the California Environmental Quality Act (CEQA). The Commission's certified regulatory program is exempt from the requirement that it prepare an Environmental Impact Report (EIR). However, its environmental analysis must meet many basic CEQA requirements. When it prepares its analysis of project alternatives, Staff follows the CEQA Guidelines in the development of its analysis.

This alternatives analysis uses the following approach, based on guidance in the CEQA Deskbook (1999):

1. Identify potential significant environmental impacts of the project.
2. Describe the project objectives.
3. Consider a broad range of alternatives, including the No Project Alternative, and select a reasonable range of alternatives that:
 - a. Avoid or substantially lessen one or more of the potential significant effects of the project; and

- b. Feasibly meet most of the basic objectives of the project.
4. If any alternatives are deemed infeasible, explain why.
5. Evaluate the environmental impacts of each feasible alternative.
6. Compare the feasible alternatives and the proposed project in regard to the environmental impacts that each would cause.
7. If the environmentally superior alternative is the No Project Alternative, identify an environmentally superior alternative among the other alternatives.

POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROPOSED PROJECT

In order to eliminate potential impacts, the alternatives screening process has focused on identification of sites that are (1) located farther from residential areas than the proposed site and/or (2) have different intake and outfall locations. It should be noted that the proposed project or any alternative site could be constructed with different cooling technologies that would reduce impacts on biological resources that could result from Bay intake and outfall.

In this Preliminary Staff Assessment (PSA), staff identifies that the Unit 7 Project has the potential to cause significant impacts to biological and cultural resources. The following summarizes those conclusions. (Staff's detailed assessment of the expected environmental consequences of the proposed project is discussed in the individual sections of the PSA.)

BIOLOGICAL RESOURCES

Potential for permanent loss of Bay habitat from construction of the cooling water intake, and impingement and entrainment from the intake of Bay water for the cooling water. It is anticipated that with sufficient mitigation/compensation those impacts can be mitigated to a less than significant level.

CULTURAL RESOURCES

Demolition of a historic building on the project site.

PROJECT OBJECTIVES

The Application for Certification (AFC) does not specifically define project objectives. The following objectives have been defined based on information in the AFC:

1. Generate 540 megawatts (MW) of power;
2. Provide electrical supply reliability and power quality benefits to San Francisco and the San Francisco Bay region;
3. Be on-line by summer peak of 2003.
4. Provide the electric reliability conditions that will allow for closure of the Hunters Point Power Plant (HPPP).

IDENTIFICATION AND SCREENING OF POTENTIAL ALTERNATIVES

ALTERNATIVES IDENTIFIED AND CONSIDERED

Staff identified and considered a broad range of potential alternatives to the proposed project in selecting those that qualified for detailed evaluation. The alternatives identified and considered were:

- No Project Alternative
- Alternative Sites

Transmission alternatives and alternatives to the 115 kV transmission line are considered in the Transmission System Evaluation section of this PSA. Other alternatives are considered in Alternatives Appendix B:

- Technology Alternatives
- Demand Side Management
- Distributed Generation
- Renewable Resources (solar, wind, biomass, hydropower, geothermal)
- Alternative Generation Technologies

ORGANIZATION OF THIS SECTION

This section is organized as follows:

- Description of the process used for alternatives identification and screening
- Discussion of alternative sites (those suggested by the Applicant, suggested by others, and those selected for detailed analysis in this assessment)
- Discussion of the No Project Alternative.

Two appendices follow this PSA section:

- Appendix A presents environmental evaluation of the five selected alternative sites (by environmental issue area)
- Appendix B presents the explanation of alternatives eliminated from detailed analysis.

IDENTIFICATION AND SCREENING OF ALTERNATIVES

Staff used a two-stage process to select alternatives for analysis: first a reasonable range of alternatives was identified and then these alternatives were screened to select those that qualified for detailed evaluation. The author considered alternatives to the project that were identified by several sources, including the applicant, members of the public, and other Energy Commission staff.

ALTERNATIVES Table 1 lists all alternatives identified in this analysis, and states whether they were considered for detailed evaluation. At the end of this section, an

explanation is presented describing the reason each alternative not considered in detail was eliminated.

ALTERNATIVES Table 1
Alternatives, Whether They Qualified for More Detailed Evaluation

Alternative	Qualify?	If Not, Why Not?
Technology Alternatives		
Demand Side Management	No	<ul style="list-style-type: none"> • Already factored into electrical system planning
Distributed Generation	No	<ul style="list-style-type: none"> • Technological, market, and regulatory barriers • Some types are infeasible • Some types could cause significant environmental impacts • Inability of applicant to effectuate • Timeliness
Renewable Resources	No	<ul style="list-style-type: none"> • Feasibility • Availability • Environmental impacts
Alternative Generation Capacities	No	<ul style="list-style-type: none"> • Feasibility
ALTERNATIVE SITES		
Applicant's Alternative Sites		
Cargo Way Site	Yes	<ul style="list-style-type: none"> • Considered in this Staff Assessment as ALT-A
Western Pacific Site	No	<ul style="list-style-type: none"> • No environmental benefit; site not available
Alternative Sites Identified by Others		
Smaller Sites	No	<ul style="list-style-type: none"> • Insufficient generation capacity; potentially greater impacts
SF Airport Area	Yes	<ul style="list-style-type: none"> • Considered in this Staff Assessment as ALT-D and ALT-E
Alternative Sites Considered in SFEC FSA		
Innes Avenue	No	<ul style="list-style-type: none"> • No environmental benefit
City Asphalt Plant	No	<ul style="list-style-type: none"> • Too small for 540 MW
SF Thermal Plant	No	<ul style="list-style-type: none"> • Too small for 540 MW
Hunters Point Power Plant	No	<ul style="list-style-type: none"> • No environmental benefit
China Basin Stadium Site	No	<ul style="list-style-type: none"> • Unavailable due to Mission Bay development underway
Mission Bay Development	No	<ul style="list-style-type: none"> • Unavailable due to Mission Bay development underway
Rail Yard South of China Basin	No	<ul style="list-style-type: none"> • Unavailable due to Mission Bay development underway
Cow Palace, Daly City	No	<ul style="list-style-type: none"> • No environmental benefit (residential developments now surround available land)
Treasure Island	No	<ul style="list-style-type: none"> • Inadequate infrastructure (transmission lines, natural gas) and geotechnical concerns related to building on fill
Hunters Point Naval Shipyard	No	<ul style="list-style-type: none"> • Development plans underway for residential and other uses
PG&E's Martin Substation, Daly City	No	<ul style="list-style-type: none"> • Inadequate land available
Tuntex Site	Yes	<ul style="list-style-type: none"> • Considered herein as ALT-C
Alternative Sites Identified by Staff		
ALT-B (Gilman Avenue, SF)	Yes	<ul style="list-style-type: none"> • Considered herein

ALTERNATIVES Table 1
Alternatives, Whether They Qualified for More Detailed Evaluation

Alternative	Qualify?	If Not, Why Not?
ALT-D (Jamie Court, South SF)	Yes	<ul style="list-style-type: none"> Considered herein
ALT-E (United Site at SFO)	Yes	<ul style="list-style-type: none"> Considered herein (site of proposed power plant currently under consideration by Energy Commission, 01-AFC-3)
3Com Park Area: Carroll Avenue	No	<ul style="list-style-type: none"> No environmental advantage
South San Francisco: Belle Air Road	No	<ul style="list-style-type: none"> Inadequate land available
3Com Park, San Francisco	No	<ul style="list-style-type: none"> Timing of availability uncertain

EVALUATION OF ALTERNATIVE SITES

Alternative sites for this project were restricted to the San Francisco Peninsula, and only as far south as PG&E's San Mateo Substation. This range of acceptable power plant sites was determined by the California Independent System Operator (CAISO) as the locations in which the required reliability benefits could be gained. Because improving electric power reliability for San Francisco is a key project objective, no alternative sites east of the San Francisco Bay or south of San Mateo were considered.

Most of the alternative sites are located near or adjacent to the San Francisco Bay. The use of once-through cooling at these locations would have similar impacts to marine biological resources as the proposed project, there are few industrial locations on the San Francisco Peninsula that are not along the bay margin. As discussed in the Soil and Water Resources section of this PSA, other cooling alternatives are available for all sites, including dry cooling, which would reduce the impacts on the marine environment.

ALTERNATIVE SITES IDENTIFIED BY THE APPLICANT

In the AFC (SECAL 2000a, AFC page 9-8) the applicant identified and evaluated two alternative sites for the proposed power plant: the Cargo Way Site and the Western Pacific Site (see **ALTERNATIVES Table 1** and **ALTERNATIVES Figure 1**). Staff has evaluated these two alternative sites. The Western Pacific Site is addressed below in the subsection discussing infeasible alternatives. The Cargo Way Site is addressed in the subsection that evaluates identified feasible alternative sites (see below). The AFC also discussed the feasibility of Mirant's other facilities in the Bay Area (the existing Pittsburg and Contra Costa Power Plants), as well as the No Project Alternative, transmission system alternatives, transmission interconnection alternatives, alternative generation technologies and configurations, alternative fuels, and alternative cooling system/water supplies. The AFC also presented a summary of the alternative sites evaluated in the San Francisco Energy Project proceeding (94-AFC-1).

ALTERNATIVE SITES IDENTIFIED BY OTHERS

An Energy Commission public workshop on alternatives was held on January 22, 2001, to describe the status of the alternative site evaluation process and request input from the public. No specific sites were suggested in that forum.

ALTERNATIVES Figure 1
Map of All Identified Alternative Sites

[This map will show all sites listed in Table 1, as well as the Martin and San Mateo Substations.]

Energy Commission staff met with staff of the City and County of San Francisco (CCSF) to discuss the alternatives process and potential sites. CCSF staff suggested that this analysis consider (a) smaller power projects that would require less land, and (b) sites close to San Francisco International Airport. Two sites near the airport are evaluated herein (ALT-D and ALT-E). Two smaller sites were considered but eliminated (rationale for elimination is presented in Alternatives Appendix B).

ALTERNATIVE SITES IDENTIFIED BY STAFF

Staff identified six potential alternative sites, three of which were carried forward for detailed analysis. One site is at the north end of the San Francisco International Airport on airport land adjacent to the United Airlines maintenance facility (ALT-E). Two sites are immediately north of 3Com Park: the Gilman Avenue (ALT-B) and Carroll Avenue sites are both vacant and used for event parking. Two sites are within the City of South San Francisco: one south of Jamie Court in an industrial area (ALT-D) and one adjacent to the City's sewage treatment plant.

STAFF'S ALTERNATIVE SITE IDENTIFICATION PROCESS

Staff considered the following criteria in identifying potential alternative sites.

1. Avoid or substantially lessen one or more of the potential significant effects of the project; and
2. Satisfy the following criteria:
 - a. Location. As described above, in order to meet reliability objectives, the site must be located on the San Francisco Peninsula north of PG&E's San Mateo Substation.
 - b. Site suitability. Approximately 10 acres are required for the site. The shape of the site also affects its usability.
 - c. Availability of infrastructure. The site should be within a reasonable distance of the electric transmission system, natural gas supply, and water supply.
3. Availability of the site.
4. Not located adjacent to moderate or high density residential areas or to sensitive receptors (such as schools and hospitals) or to recreation areas.

Staff began by identifying an initial study region. The region consisted of the San Francisco Peninsula, from the northernmost point to the PG&E San Mateo Substation at the south end of the study region. This region was defined based on input from the California Independent System Operator (CAISO) defining the area within which a power plant would be considered to provide reliability benefits to the City of San Francisco. The CAISO identified two areas of consideration for alternatives: the highest priority area for alternatives is north of PG&E's Martin Substation (in Daly City), and the second priority for alternatives would be north of PG&E's San Mateo Substation but south of the Martin Substation (see **ALTERNATIVES Figure 1**).

SELECTION OF ALTERNATIVES FOR MORE DETAILED EVALUATION

SCREENING CRITERIA

To select alternatives for detailed evaluation, staff applied the two basic criteria specified in the CEQA Guidelines:

- Avoid or substantially lessen one or more of the proposed project's significant effects.
- Feasibly accomplish most of the basic project objectives.

For alternative sites, staff used the site identification criteria specified above to address feasibility.

ALTERNATIVE SITES THAT SATISFIED THE SCREENING CRITERIA

Staff identified five sites that satisfied the screening criteria and therefore qualified for more detailed evaluation as alternatives to the proposed site. **ALTERNATIVES Figures 2 through 5** are maps showing the five alternative sites. The sites, designated ALT-A through ALT-E, are described as follows.

ALT-A, CARGO WAY, SAN FRANCISCO

This site is on Port of San Francisco land (property SWL 344.1) at the southwest corner of Cargo Way and Amador Street. This site is an alternative presented in Mirant's AFC. This site was approved by the Energy Commission as the site for the San Francisco Energy Corporation (SFEC) power plant in 1995. However, the project proponent was unable to secure a lease for the project from the Port Commission, so it was not constructed. However, the Cargo Way site is further from residences than the proposed Potrero site. This site is surrounded by industrial land uses; the nearest residences are approximately five to six blocks to the south.

The Cargo Way site is about 2,500 feet from the San Francisco Bay but only 500 feet from Islais Creek, so cooling water would be from the same source as for the proposed project. A 115kV transmission line would have to be constructed to the Hunters Point Substation (approximately one mile to the southeast).

ALT-B, GILMAN AVENUE, 3COM PARK AREA, SAN FRANCISCO

The site is located immediately east of Arelious Walker Drive and north of Gilman Avenue. This site is currently used as a parking lot for events at 3Com Park. However, the future use of 3Com Park for major events (football) is in question, and closure of the Park would eliminate the need for use of this site for parking. East of this site is undeveloped park property owned by the State of California. The CCSF's General Plan identifies this as potential future park.

This site is located just over 1,000 feet south of South Basin and about 2,400 feet from the Bay itself. Therefore, it is assumed that a power plant at this location would also utilize cooling water from the San Francisco Bay. The 115kV

transmission system is less than one mile to the west, and a transmission interconnection would be required.

ALT-C, TUNTEX SITE, BRISBANE

This site is located within a large (100 acre) area of vacant land that was historically used as a rail yard. The alternative site is located immediately northeast of the intersection of Bayshore Boulevard and Geneva Boulevard, just east of PG&E's Martin Substation. The site would extend north of Geneva Avenue (due to the more severe contamination issues south of Geneva). The portion of the site located north of Geneva has undergone remediation for heavy metals contamination. The site portion south of Geneva is still contaminated with hydrocarbons. The Brisbane General Plan calls for this site to be used for "Trade Commercial Planned Development" (hotels, research and development, etc.).

This site is about 4,000 feet west of the Bay, so cooling water would have to be brought from the Bay in a pipeline (difficult and expensive to construct, below the 101 Freeway and railroad tracks). More likely, water used at this site would be reclaimed water purchased from the CCSF's Southeast Water Treatment facility, which is located approximately 3 miles north of this site. The transmission interconnection would be only a line across Bayshore Boulevard into the existing PG&E Martin Substation.

ALT-D, EAST JAMIE COURT, SOUTH SAN FRANCISCO

This alternative site was considered for a power plant by AES Corporation in 1998-1999. It is south of East Jamie Court and east of Haskins Way, south of E. Grand Avenue, adjacent to the City's recycling facility. There are about 20 acres vacant at this location, which is due north of San Francisco International Airport.

The site is located directly on the San Francisco Bay (the San Bruno Channel passes adjacent to this shoreline), so has access to cooling water. The transmission system is approximately 1.3 miles to the west, so construction of an interconnection would be required.

ALT-E, UNITED GOLDEN GATE SITE, SF AIRPORT

This site was presented to the Energy Commission in a recent AFC (01-AFC-3) for a proposed 570 MW power plant, adjacent to the existing United Golden Gate cogeneration facility. A 51 MW peaker power plant was also approved for this site by the Energy Commission in March 2001. The site is south of North Access Road and east of United's existing 49 MW cogeneration plant. A San Mateo County homeless shelter is located north of North Access Road, but aside from the shelter, the nearest residences are approximately 10 blocks to the north and west.

ALTERNATIVES Figure 2

Map (1 of 2) of the Alternative Sites that Qualified for Detailed Evaluation

[This map will show the proposed project and Alts-A through -C]

ALTERNATIVES Figure 3

Map (2 of 2) of the Alternative Sites that Qualified for Detailed Evaluation

[This map will show ALT-D and Alt-E

There is an existing powerline connecting the cogeneration unit with the transmission system that is located about 0.75 miles west of the site, but this line would need to be upgraded to carry the additional power generated by a plant of over 500 MW. The site is located immediately south of the San Bruno Slough, a tidal marsh area of the San Francisco Bay, so cooling water from the Bay is assumed to be available within 0.6 miles.

EVALUATION OF ALTERNATIVE SITES

The five alternative sites are evaluated in the areas listed below. These analyses are presented in Alternatives Appendix A.

- Air Quality
- Biological Resources
- Cultural Resources
- Geological and Paleontological Resources
- Noise
- Public Health
- Socioeconomics
- Soil and Water Resources
- Traffic and Transportation
- Visual Resources
- Waste Management

SUMMARY OF IMPACTS OF ALTERNATIVE SITES

Alternatives Table 2 presents a summary of the comparative impacts of the five alternative sites with the proposed project. The Gilman Avenue site (ALT-C) and the Tuntex site (ALT-D) have the potential for greatest impacts, of all the alternative sites. The two southernmost sites, Jamie Court and the UGG site, are likely to have the least impacts overall.

ALTERNATIVES Table 2
Comparison of Impacts: Alternative Sites

Issue Area		ALT-A Cargo Way	ALT-B Gilman Avenue	ALT-C Tuntex Site	ALT-D Jamie Court	ALT-E UGG Airport
Air Quality		similar to proposed project	similar to proposed project	similar to proposed project	similar to proposed project	similar to proposed project
Biological Resources	Terrestrial	similar to proposed project	similar to proposed project	similar to proposed project	similar to proposed project	similar to proposed project
	Marine	similar to proposed project	slightly greater impacts than proposed project	slightly greater impacts than proposed project	somewhat greater impacts than proposed project	somewhat greater impacts than proposed project
Cultural Resources		less impact than proposed project	less impact than proposed project	similar or somewhat less than proposed project	similar or somewhat less than proposed project	less impacts than proposed project
Geological and Paleontological Resources		similar to proposed project	similar to proposed project	similar to proposed project	similar to proposed project	similar to proposed project
Noise		no impact	no impact	no impact	no impact	potential to impact homeless shelter
Hazardous Materials Management		greater impacts than proposed project	greater impacts than proposed project	similar to proposed project	similar to proposed project	less impacts than proposed project
Socioeconomics		greater impacts than proposed project	greater impacts than proposed project	greater impacts than proposed project	less impacts than proposed project	less impacts than proposed project
Soil and Water Resources		similar to proposed project	similar to proposed project	greater impacts than proposed	less impacts than proposed	less impacts than proposed
Traffic and Transportation		inferior to proposed project	inferior to proposed project	inferior to proposed project	similar to proposed project	similar to proposed project
Visual Resources		no potential for significant impacts	potentially significant visual impacts	potentially significant visual impacts	no potential for significant impacts	no potential for significant impacts
Waste Management		contaminants present but impacts mitigable	no data available	contaminated site; current condition unknown	no data available	no contaminants known to be present

NO PROJECT ALTERNATIVE

The CEQA Guidelines state, “The purpose of describing and analyzing a No Project Alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project.” (Cal. Code Regs., tit. §15126.6(e).) Toward that end, the No Project analysis considers “existing conditions” and “what would be reasonably expected to occur in the foreseeable future if the project were not approved...” (Ibid.)

The No Project Alternative assumes that the proposed project is not constructed. In this case, the No Project Alternative would be leaving the plant “as is”. Units 3 (a 206 MW steam turbine unit) and Units 4, 5, and 6 (each 52 MW combustion turbines) would remain in operation. No new combined-cycle units would be added.

The Mirant AFC (SECAL 2000a, AFC pages 9-4 to 9-6) states that the No Project Alternative would result in potentially greater environmental effects than the proposed project. As stated in the AFC, the No Project Alternative could result in the following conditions or actions (each of these issues is discussed in more detail below):

- Continued operation of the HPPP
- Reduced ability to meet State policy objectives of increased competition in the generation market
- Retaining environmental effects of the existing Potrero Power Plant (which would be reduced with implementation of the Unit 7 Project)
- Construction of new transmission lines to San Francisco or other power plants within San Francisco
- Continued operation of other less efficient power plants in the region
- Inability to convert the PPP site to port-related industrial uses (this would be true whether or not the proposed project is implemented).

CONTINUED OPERATION OF HUNTERS POINT POWER PLANT

The AFC repeatedly states that the major benefit of implementing the Unit 7 project would be the closure of the HPPP. However, that closure is not guaranteed if this project is constructed. First, the closure agreement is between PG&E and the CCSF, and Mirant is not a party to the agreement. Second, the ultimate authority in determining when Hunters Point can be closed is the CAISO; this decision will be based on the presence of adequate generation in and transmission to the San Francisco area.

PG&E has stated “If the Potrero project is approved as proposed, we believe there is sufficient capacity to allow the closure of the Hunters Point Power Plant, without the completion of the Jefferson-Martin line [see additional discussion under Transmission Alternatives, below]. However ... the closure of the Hunters Point Power plant cannot proceed until the CAISO deems it no longer necessary to meet reliability criteria and FERC relieves us of our must-run obligations” (PG&E, 2001).

Assuming that the Potrero project is completed as planned, the ability of the system to meet CAISO reliability criteria in the area will be determined primarily based on both the estimated load growth for the area and availability of the Jefferson-Martin line. In a response to a data request, the CAISO addressed a number of questions regarding the potential for closure of the HPPP (CAISO, 2001). The CAISO has also listed a number of other local transmission system upgrades that are also required. At this time, the CAISO transmission studies and load growth estimates are not available for periods after 2006. The CAISO has informed staff that a final determination regarding closure of Hunters Point Power Plant may not be made until after both the Potrero Unit 7 project is complete and PG&E's San Francisco transmission connection (Jefferson-Martin 230 kV Project) is installed (the transmission project could be operational. In fact, the CAISO's San Francisco Peninsula Long-Term Electric Transmission Planning Technical Study (CAISO, 2000) states in its Executive Summary "However, this transmission alternative will not eliminate the need for Reliability Must Run (RMR) generation (Hunters Point and Potrero) on the San Francisco Peninsula."

The CAISO states that it will not be able to determine the RMR status for Hunters Point generation until summer 2003, and points out that its current planning horizon extends only to 2006. The CAISO also states that while "Preliminary assessments indicate that with the addition of the Jefferson – Martin 230 kV line and the Potrero Unit 7 Project, this allow the shut down of Hunters Point Power Plant while maintaining acceptable reliability levels in the City. However, as mentioned ... additional planning studies would be needed before a confirmation can be provided." Staff is in agreement with Mirant that the HPPP would likely remain operational in the absence of the proposed project (in the No Project scenario) and that there is a reasonable chance that the completion of the Unit 7 project could provide for the shutdown of the HPPP. However, given the CAISO's planning timeframe, staff cannot agree at this time that construction of the Unit 7 project would necessarily result in the closure of the HPPP.

ABILITY TO MEET STATE POLICY OBJECTIVES

Staff agrees with Mirant that construction and operation of the proposed project would be consistent with State policy objectives that call for construction of additional power plants to enhance electric power reliability. Conversely, the No Project Alternative would be inconsistent with those policy objectives.

ENVIRONMENTAL EFFECTS OF CONTINUED OPERATION OF THE POTRERO POWER PLANT

The AFC states that the No Project Alternative would cause the area to "forego air emissions reductions that would occur with the development of Unit 7 and shutdown of the Hunters Point Power Plant." As discussed above, it is not certain that the HPPP will be shut down. However, if the HPPP is shut down or if its operation is substantially reduced as a result of the Unit 7 project, there would be dramatic reductions in NOx and PM10. In the SFEC case, staff testified that a new project would dramatically reduce regional air emissions, even using the most conservative assumptions for system operation due to the displacement of older generating units with newer, more efficient units.

The Potrero Unit 7 project is not a “modernization” project in which older generating units would be taken off-line and replaced by more efficient and less polluting new units. The existing units (3, 4, 5, and 6) are expected to continue operation in addition to Unit 7. While Mirant will implement selective catalytic reduction (SCR) technology in 2004 to reduce nitrous oxide emissions for Unit 3, this will occur whether or not the Unit 7 project is approved. Therefore, staff finds no potential environmental benefits of the No Project Alternative with respect to impacts that could be reduced if the proposed project were approved.

CONSTRUCTION OF NEW TRANSMISSION LINES TO SAN FRANCISCO

The CAISO’s San Francisco Long-Term Study considers a range of options for increasing the electric reliability situation for San Francisco. The purpose of this study has been to evaluate options that will increase electric reliability for San Francisco. It concludes that a new 230 kV transmission line is required and that this solution is preferred to a generation solution (partially because the study acknowledges that new generation at Potrero could result in the closure of the HPPP, therefore reducing the amount of existing generation within San Francisco). In fact, PG&E has started the process of preparing permitting documentation for the transmission route identified in the CAISO’s study as being the preferred route: the Jefferson-Martin 230 kV Transmission Project. PG&E states

“We are working closely with CAISO to plan, permit, design, and build new transmission facilities into San Francisco. Should the CAISO decide that the new Potrero Plant alone is not adequate to meet reliability standards, we want to be sure a realistic back-up plan exists to speed plant closure.” (PG&E, 2001)

This project is expected to start permitting during 2002, whether or not the Potrero project is approved. Therefore, staff disagrees with the AFC’s statement that the No Project Alternative could require new transmission lines: those lines are expected to be constructed regardless of the Potrero action.

CONCLUSION REGARDING NO PROJECT ALTERNATIVE

Staff believes that, overall, the No Project Alternative is not superior to the proposed project for the following reasons:

1. The No Project Alternative would be environmentally superior to the proposed project if the project were constructed without the mitigation required in this PSA. This is because the Unit 7 project could, without mitigation, have significant environmental impacts in several areas, including visual resources, biological resources, and air quality resources. These impacts would be avoided by not constructing and operating the Unit 7 project. However, staff believes that the mitigation measures proposed by the applicant and in this PSA will reduce any impacts of nearly all impacts to less than significant levels.

2. In the No Project scenario, the HPPP would not be replaced by a newer, more reliable facility. While it is not certain that the HPPP would continue to operate with Unit 7, it is certain that it will continue to operate in the absence of the Unit 7 project. If the Unit 7 project is not constructed, the HPPP's generation would be needed indefinitely to provide electric reliability to the San Francisco north peninsula. The HPPP facility is old, has high emissions, and is not as reliable as a newer facility.
3. In the No Project scenario, there would be greater reliance on Potrero Units 3 through 6, which are also older and have relatively higher emissions.
4. Without the Unit 7 project, there would be higher regional emissions of NOx and PM10 by other older, less efficient power plants (outside of the City of San Francisco).
5. The No Project Alternative might be expected to result in (1) building of a power facility elsewhere on the northern San Francisco Peninsula, and/or (2) construction of additional transmission facilities to meet necessary reliability criteria. Depending on their location, these facilities would also have environmental impacts that could be significant.

Staff agrees that both the major electric deregulation legislation, AB 1890 (1996), and, more recently, SB 110 (1999), have emphasized the necessity for the siting new power plants which increase reliability, improve the environmental performance of the current electric industry, and reduce consumer costs.

REFERENCES

- CEC (California Energy Commission). CEC2000DReq3A(PG&E). California Energy Commission (CEC) staff Data Requests, Set 3A (PG&E), Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to Pacific Gas and Electric Company (PG&E), December 28, 2000.
- CAISO (California Independent System Operator). 2000. San Francisco Peninsula Long-Term Electric Transmission Planning Technical Study (2004 – 2009), Final Report, Version 5. October 5, 2000.
- CAISO (California Independent System Operator). 2001. Response to Data Request from Southeast Alliance for Environmental Justice (SAEJ).
- Hupman, J. M and Chavez, D. 1995. Archaeological Resources Investigations for the Waterfront Plan EIR, San Francisco, California: Southern Waterfront. Report No. S-16882 on file at the Northwest Information Center, Rohnert Park.
- Hupman, J. M and Chavez, D. 1997. Archaeological Resources Investigations for the Candlestick Point Stadium and Retail/Entertainment Center Project, San Francisco, California. Report No. S-20321 on file at the Northwest Information Center, Rohnert Park.

McKale, G. and Gillies, S. E. P. 2000. Cultural Resource Assessment, Phase II, United Golden Gate Power Project, San Francisco International Airport, San Mateo County, California. Report No. S-23263 on file at the Northwest Information Center, Rohnert Park.

Office of Historic Preservation. 2001. Directory of Properties in the Historic Property Data File for San Mateo County. On file at the Northwest Information Center, Rohnert Park.

Praetzellis, A., White G., Naidu, R. B. G., and Olmsted, N. 1994. San Francisco Energy Company, Application for Certification, Cultural and Paleontological Resources. Report No. S-16555 on file at the Northwest Information Center, Rohnert Park.

PG&E (Pacific Gas and Electric Company). 2001. Letter to Marc Pryor, Energy Commission. May 3, 2001.

SECAL (Southern Energy California). 2000a. Application for Certification, Potrero Power Plant Unit 7 Project (00-AFC-4). Submitted to the California Energy Commission, May 31, 2000.

ALTERNATIVES APPENDIX A: ANALYSIS OF ALTERNATIVE SITES

AIR QUALITY

The purpose of this air quality alternative analysis is to provide an approximate comparison of the air quality impacts of the Potrero Unit 7 project at the proposed site and the five alternative sites. All are located in the Bay Area Air Quality Management District (District).

With respect to air quality, the same federal, state and local LORS apply to the proposed and the 5 alternative sites. A discussion of the applicable LORS can be found in staff's AIR QUALITY testimony.

All five alternative sites and the proposed site are located in the same type of terrain. Thus the project emission impacts, as presented in the staff AIR QUALITY testimony, would likely be similar at the proposed and each alternative site.

BACT requirements are similar for combined cycle projects in the district's boundary. For NO_x, an emissions rate of 2.5 ppm on a three-hour average, and an oxidation catalyst to control CO and organic emissions would qualify as BACT for the project at any site.

Offset requirements would be the same if the project is located at any alternative sites, or the proposed site.

Staff believes that the air quality impacts from the five alternative sites and the proposed site would be essentially the same for all sites.

BIOLOGICAL RESOURCES

Potential impacts to aquatic biological resources from the applicant's proposed project could occur from in-water construction of new intake and outfall facilities, entrainment and impingement by the intake of Bay waters, and the discharge of heated cooling water. For the purpose of this analysis, it is assumed that all five alternative sites would use once-through cooling water from San Francisco Bay. Any site that would not involve intake or discharge of Bay waters would have little to no impact on aquatic biological resources and, thus, would be less impacting to aquatic resources than the proposed project at the Potrero site. Impacts to terrestrial biological resources could result from habitat loss or disturbance or impacts on sensitive species. The reader should refer to the **Biological Resources** section of this PSA for the proposed, which evaluates the impacts to biological resources at Potrero.

In the following discussion, terrestrial biological resources are addressed first, followed by aquatic biological resources.

Any federal, state and local LORS pertaining to biological resources would apply to all the alternative sites, although it is important to note that Alternatives A and B are

in the City and County of San Francisco and Alternatives C, D and E are in San Mateo County.

TERRESTRIAL BIOLOGICAL RESOURCES

The following table provides a summary of each of the alternative sites, geographical reference, sensitive habitats in the vicinity and sensitive species occurrences on or adjacent to the site. Information is provided relative to the applicant's selected site in order to facilitate comparison to that site.

ALTERNATIVES Table A1
Summary of Alternatives and Sensitive Terrestrial Biological Resources

Alternative	Location from Potrero Site	Vegetation or Wildlife Habitat in or Immediately Adjacent to Site	Sensitive Biological Resources
ALT- A, Cargo Way Site Cargo Way, San Francisco	0.75 miles south, 1000 feet south of Islais Creek	Industrial lot.	No occurrences of Federal or State threatened or endangered species on or adjacent to the site.
ALT – B, 3Com Park Site Gilman Av., San Francisco	2.75 miles south, north of 3Com Park	Sparsely vegetated lot.	Bayview Park, approx. 0.5 miles to the SW. CNDDDB registers occurrence of Diablo helianthella (<i>Helianthella castanea</i>) in the park.
ALT – C, Tuntex Site Bayshore Blvd., Brisbane	3.6 miles south, near railroad yard	Large vacant, sparsely vegetated lot adjacent to rail. Several (6) blacktail jackrabbit (<i>Lepus californicus</i>) were observed.	No occurrences of Federal or State threatened or endangered species on or adjacent to the site.
ALT – D, South San Francisco Site E. Jamie Ct., South San Francisco	8 miles south	Vacant lot, disturbed surface soil and vegetation, small patches of dense herbaceous vegetation. Lot ends approx. 30 feet from shoreline.	No occurrences of Federal or State threatened or endangered species on or adjacent to the site.
ALT – E, United Golden Gate Site North Access Road, San Bruno	8.5 miles south SF Airport, at United Golden Gate cogenerat ion plant	Site located in parking lot. Nearest habitat is marsh (San Bruno Slough) located on opposite side of North Access Road, approx. 75-100 feet north. Observed waterfowl, cordgrass, pickleweed and saltgrass.	San Bruno Slough immediately to the north. No occurrences of Federal or State threatened or endangered species on or adjacent to the site.

Staff did not complete an exhaustive field survey of each alternative site. Instead, a field reconnaissance was completed and wildlife or wildlife within or near the site was noted. All alternatives are located within commercial and/or industrial areas.

Alternatives A, B and C are located inland from the shore and Alternatives D and E are located on or very near the shoreline. Alternatives A, C and E are or have been considered for siting of other energy facilities and previous analyses did not indicate adverse biological impacts.

According to the California Natural Diversity Database (CNDDDB), none of the sites overlap with or are adjacent to occurrences of state or federally listed threatened or endangered species. Because of the location of these sites any potential habitat in the area is extremely fragmented and therefore, the analysis of sensitive species focused on occurrences either on or adjacent to the alternative site, rather than a larger radius. Relatively speaking Alternatives A and E, like the selected Potrero site offer negligible to no habitat resources on the site relative to the other alternatives that do support some disturbed vegetation. At alternative sites B, C and D, the soil surface has been disturbed and compacted, there is not surface water present on the site, vegetation is sparse and cover is limited in all cases to herbaceous plants. No native trees, riparian or other sensitive habitats or vegetation are found in or immediately adjacent to any of the alternative sites.

This does not preclude the presence of wildlife (see ALTERNATIVES Table A1, Alternative C) that can adapt to urban conditions. In this respect, the CNDDDB indicates that it is unlikely that wildlife would include sensitive species. The sighting of jackrabbits at Alternative C is in part, because this site can provide habitat resources by virtue of its being part of a larger area of abandoned land adjacent to the railroad tracks where there are no buildings or human access.

Because these sites are abandoned lots or parking lots within developed zones, there is little or no opportunity for wildlife movement among patches of better habitat. The only possible exception would be Alternative D, where wildlife movement could occur along the shoreline.

The results of this analysis indicate that none of the alternative sites would result in significant direct impacts to terrestrial biological resources within the footprint of the project.

With respect to off-site indirect impacts, Alternative B is located northeast of Bayview Park, while Alternative E is immediately south of San Bruno Slough. Primary sources of off-site, indirect impacts to terrestrial biological resources may occur from noise and air emissions. With respect to noise, Alternative B is located below and far enough away from Bayview Park, such that noise impacts would be negligible. Alternative E is located near the airport, adjacent to the existing cogeneration plant and is separated from San Bruno Slough by a road where there is considerable continuous and intermittent noise during the day. Therefore, the additional noise source is unlikely to cause significant increases to either continuous or intermittent noises. With respect to air emissions, Alternative B is located downwind of Bayshore Park, relative to the predominant wind direction and Alternative E is located upwind of the slough, although any emissions from a potential power plant are likely to be dispersed beyond the immediate vicinity of the marsh.

The **Biological Resources** section of the Staff Assessment addresses potential impacts of air emissions on San Bruno Mountain located to the SW of the Potrero site. The alternative sites are nearer to this site and therefore, offsite emissions may have a slightly greater impact; however, similar to the analysis provided in that section these impacts are considered insignificant since the majority of emissions would be dispersed to the northeast.

Therefore, none of the alternative sites would result in significant indirect off-site impacts to biological resources from noise or air emissions.

CONCLUSION

Staff believes that locating the project at any of these alternative sites is unlikely to result in significant environmental impacts to terrestrial biological resources.

AQUATIC BIOLOGICAL RESOURCES

Staff conducted a preliminary analysis of biological resources potentially present at the five alternative sites for the Potrero project. The analysis is based on general information about the distribution of aquatic species in San Francisco Bay. No site-specific surveys of aquatic resources were conducted at the alternative sites.

SUMMARY OF PROPOSED PROJECT IMPACTS

Potential impacts to aquatic biological resources from the applicant's proposed project at the Potrero site could occur from in-water construction of new intake and outfall facilities, entrainment and impingement by the intake of Bay waters, and the discharge of heated cooling water. The significance of impacts to aquatic biological resources of the proposed project has not been determined yet. The applicant is currently conducting surveys to update information on the occurrence of aquatic species at the site. Species of potential concern that may be affected by the proposed project at the Potrero site include Pacific herring, Bay shrimp, Dungeness crab, longfin smelt, green sturgeon, Chinook salmon and steelhead.

Pacific herring, which spawn in the vicinity of the Potrero Power Plant, support an important commercial fishery in San Francisco Bay. They lay their eggs in shallow water on hard substrate or on marine vegetation.

Bay shrimp also have been collected in the vicinity of the Potrero site. There is a live bait fishery for bay shrimp in San Francisco Bay. Key fishing locations include South Bay, northwestern San Pablo Bay and Carquinez Strait.

San Francisco Bay is an important nursery area for Dungeness crabs, which support a commercial fishery outside the Bay. In January 2001, the applicant collected substantial numbers of Dungeness crab in the vicinity of the Potrero Power Plant. The crabs ranged in size from 37 to 115 mm. At that size they are ready to recruit into the fishery.

Longfin smelt, a Federal Species of Concern and State Species of Special Concern, are common in the vicinity of the Potrero Site.

Green sturgeons are a Federal Species of Concern and a State Species of Special Concern. San Francisco Bay estuary supports the southernmost reproducing population of green sturgeon, which spawn in the Sacramento River. They have a slight potential to occur in the waters near the Potrero Plant and be affected by the proposed project.

Three runs of Chinook salmon spawn in the Sacramento River, and to a lesser extent, the San Joaquin River. The adults move from the Pacific Ocean through San Francisco Bay to their spawning rivers where they spawn and die. When the smolts are 1 year old, they move downstream through the Bay to the ocean. The winter run is Federal and State Endangered. The spring run is Federal and State Threatened. The Central Valley fall/late fall run is a State Species of Special Concern. Critical Habitat for Chinook salmon does not extend south of the San Francisco-Oakland Bay Bridge, but Chinook salmon are sometimes collected in the vicinity of the Potrero Plant and could be affected by the proposed project.

The Central California Coast Evolutionarily Significant Unit (ESU) of steelhead is Federal Threatened. Existing steelhead runs occur in several streams in south San Francisco Bay. All of south San Francisco Bay is within designated Critical Habitat for the Central California Coast ESU and the species has the potential to be affected by the proposed project at the Potrero site.

ALTERNATIVE SITES

ALT-A CARGO WAY, SAN FRANCISCO

This alternative site is very close to the proposed project site at Potrero. The aquatic species that have the potential to be affected at this site would be the same as for the proposed project. Assuming that a power plant at this site would use a cooling water system that withdraws water from San Francisco Bay, the impacts to aquatic resources would be similar to the proposed project at Potrero.

ALT-B 3COM PARK AREA: GILMAN SITE

This alternative site is further south than the applicant's proposed site at Potrero. The distribution of aquatic resources near this site would still be expected to be similar to that at Potrero. However, there is some intertidal mudflat habitat near this site. Therefore, there is some potential for a greater diversity of species to be affected by cooling water intake and discharge. Therefore, the impacts to aquatic resources might be slightly greater than that of the proposed project at Potrero if cooling water were withdrawn from the Bay and discharged to Bay waters.

ALT-C TUNTEX SITE, CITY OF BRISBANE

If cooling water were withdrawn and discharged to the Bay at this site, the impacts would be expected to be similar to ALT-B. The fish and epibenthic invertebrates of concern that may be affected would be similar to those at the proposed project site at Potrero. However, the presence of intertidal mudflats along this section of the shore might result in a more diverse assemblage of species being affected and

impacts to aquatic resources might be slightly greater than those for the proposed project.

ALT-D SOUTH SAN FRANCISCO (EAST JAMIE COURT) AND ALT-E SF AIRPORT (UNITED GOLDEN GATE SITE)

Both of these sites are considerably south of the proposed project site at Potrero. Therefore, if they used cooling water from the Bay a somewhat different assemblage of species might be affected by cooling water withdrawal and discharge. The aquatic assemblage of South Bay would be expected to be less marine in character than that near the Potrero site because of the greater distance to the Golden Gate. Recruitment may be more variable because of the lack of ocean influence. Therefore, the overall potential to affect aquatic species by cooling water intake and discharge may be greater at this site than at Potrero. Furthermore, potential impacts on Bay shrimp and steelhead may be somewhat greater than at the Potrero site. Remnant steelhead runs occur in several South Bay creeks that are closer to these sites than Potrero. The South Bay is one of the areas fished most heavily for Bay shrimp. These sites are also close to intertidal mudflats that would be expected to support a different assemblage than at Potrero.

On the other hand, the chances of affecting Chinook salmon and green sturgeon would be less than at Potrero because these sites are considerably south of the migration paths of these species. There also might be a somewhat reduced chance of impacting Dungeness crab, longfin smelt, and Pacific herring because the population centers for these species are Central and/or San Pablo Bays.

Overall, because these sites would affect waters that are somewhat more isolated from the ocean than the Potrero site, the potential for impacts to aquatic resources is likely to be somewhat greater.

CONCLUSIONS

If cooling water were withdrawn from and discharged to San Francisco Bay for each of these alternatives, the impacts to aquatic biological resources would be similar to those of the proposed project at Potrero. None of the alternative sites would result in a lower impact to aquatic resources than the proposed site at Potrero. Assuming a similar intake and outfall design and a similar volume of water withdrawal, the impacts of ALT-A Cargo Way, San Francisco would be almost identical to the proposed project because the location is so close to Potrero. ALT-B and ALT-C might have slightly greater impacts to aquatic resources than Potrero because of the proximity of intertidal mudflats, a habitat that does not occur in the vicinity of the Potrero intake and outfall. ALT-D and ALT-E would have less potential than the proposed project to impact Chinook salmon, Green sturgeon, Dungeness crab, Pacific herring and longfin smelt, but might be more likely to affect steelhead and Bay shrimp. ALT-D and ALT-E might also affect intertidal mudflat habitat. Overall, the impacts of ALT-D and ALT-E on aquatic resources is considered to have the potential to be greater than the proposed project and ALT-A, ALT-B and ALT-C because the more southerly part of South Bay represents a more unique environment than the northerly portion and one with less ocean influence.

CULTURAL RESOURCES

Five alternative sites for the Potrero Power Plant Unit 7 Project have been selected for analysis. The purpose of this analysis is to compare the five alternative sites with the proposed Potrero site on the basis of expected impacts to cultural resources. Please refer to the Cultural Resources section of this document which evaluates the impacts to cultural resources from the use of the Potrero site.

Any federal, state, and local LORS pertaining to cultural resources would apply to all the potential sites. Please refer to the **Cultural Resources** section.

The proposed site is located on the shoreline of San Francisco Bay in southeastern San Francisco County. The alternative sites are located on or near the shoreline and are located in southeastern San Francisco County and northeastern and eastern San Mateo County. Staff has identified the following alternative sites:

- ALT-A: Cargo Way, San Francisco
- ALT-B: 3Com Park Area: Gilman Site
- ALT-C: Tuntex Site, City of Brisbane
- ALT-D: South San Francisco: East Jamie Court
- ALT-E: San Francisco Airport: United Golden Gate (UGG Site)

Refer to the section on **Alternatives Description** for the specific location of the alternative sites.

SUMMARY OF PROPOSED PROJECT IMPACTS

The proposed project at the Potrero property has the potential to affect buried historical resources. Historical research indicates that a mid-nineteenth century powder magazine and an associated dwelling once occupied the property. Structural remains and refuse associated with these structures could be encountered during excavations associated with new power plant facilities. In addition, two structures evaluated as eligible for the National Register of Historic Places (NRHP) will be demolished, as required by the San Francisco unreinforced masonry building ordinance. These two structures are the Compressor House and the Meter House which were part of a gas plant where gas was manufactured from petroleum.

ALTERNATIVE SITES

A cultural resources records search was performed for the five alternative locations by the Northwest Information Center of the California Historic Resources Inventory. Information provided by the information center included archaeological and historical resources site records, a bibliography of previous surveys and investigations and the mapped locations of sites, resources, and surveys within one half mile of each alternative site. Historic maps showing the shoreline in the nineteenth century were also provided. These maps were used to determine whether each alternative site is located on fill placed in what was formerly a part of San Francisco Bay in prehistoric times. Where this is the case, there is a low potential for prehistoric archaeological sites. It is possible that sites dating to the

Early Holocene could have been occupied in these areas when sea level was lower, however. There is also the potential for buried nineteenth century shipwrecks. Such ships could have sunk in the bay and then been covered with fill.

ALT-A

The ALT-A site is on fill placed in the bay. Thus, the potential for prehistoric sites is low. This property has been covered by two previous surveys (Praetzellis, et al. 1994; Hupman and Chavez 1995). No cultural resources were identified as a result of either survey. One prehistoric site, CA-SFR-15, has been recorded within one-half mile of the property. This site was located just inland from the original shoreline overlooking the Islais Creek estuary system.

ALT-B

The ALT-B site near 3Com Park is also on fill placed in the bay and has a low potential for prehistoric sites. No cultural resources were identified on the property as a result of a previous survey (Hupman and Chavez 1997). There are six prehistoric shellmounds recorded within one-half mile of the property. However, all of these are on, or just inland, of the original shoreline.

ALT-C

The ALT-C site in Brisbane is on or near the original shoreline, so there is a potential for encountering prehistoric sites. The property has not been previously surveyed for cultural resources. Two prehistoric sites are located along the original shoreline within one-half mile of the property. One of these (P-41-000496) is located within 1,000 feet of the property and contains human remains. In addition, one historical resource (CA-SMA-326H), the foundations of a historic period dairy barn, is located within one-half mile of the property.

ALT-D

The ALT-D site near Point San Bruno is on fill placed in the bay and has a low potential for prehistoric sites. No cultural resources surveys have been performed within one-half mile of the property and no prehistoric cultural resources have been identified within one-half mile of the property. One historic building, the W. P. Fuller and Company Paint Plant at 450 East Grand Avenue, has been identified near the property. The structure was originally constructed in 1898 and has been evaluated as "may become eligible for the National Register of Historic Places as a separate property" (NRHP Status Code 4S) (Office of Historic Preservation 2001). This usually means that not enough research has been completed to make a formal determination. Although this structure would not be physically affected by construction of a power plant nearby, the integrity of its setting could be altered by power plant construction.

ALT-E

The ALT-E site at San Francisco Airport was originally marsh and tidal channels and has a low potential for prehistoric sites. No cultural resources were identified on the property as a result of a previous survey (McKale and Gillies 2000). No cultural resources have been recorded within one-half mile of the property.

CONCLUSION

There is a low potential for prehistoric cultural resources to be encountered at Alternative Sites A, B, D, and E since these properties were originally part of San Francisco Bay, now covered by fill. However, as previously noted, there is a possibility that prehistoric sites dating to the Early Holocene or nineteenth century shipwrecks could exist in these locations. There is a greater potential for a prehistoric site to occur at Alternative Site C, located near the original shoreline. A prehistoric site with human burials is recorded within 1,000 feet of Alternative C. Alternative D has the potential to alter the setting of an NRHP eligible structure, the Fuller Paint Plant, built in 1898.

Thus, of the five alternative sites, Alternatives A, B, and E have little potential to affect cultural resources while Alternatives C and D have a greater potential to affect cultural resources.

The proposed project at Potrero has the potential to affect buried historic resources and will result in the demolition of NRHP eligible structures. Compared with the proposed project at Potrero, Alternatives A, B, and E have less potential to affect cultural resources. Alternatives C and D could have similar or somewhat less potential to affect cultural resources compared to the proposed project at Potrero. A better assessment of the potential to affect cultural resources at Alternatives C and D would require field surveys and historical research.

GEOLOGICAL AND PALEONTOLOGICAL RESOURCES

INTRODUCTION

The purpose of staff's alternatives analysis is to assess alternatives that could feasibly attain the project's objectives and avoid or substantially lessen one or more of the significant effects of the project. The analysis also identifies and compares the impacts of the various alternatives but in less detail than the proposed project.

The Commission staff concluded that strong ground shaking and liquefaction potential at the Potrero Power Plant site comprise adverse impacts that can be mitigated by compliance with the applicable LORS and that the proposed project should have no adverse impacts with respect to geological and paleontological resources. Based on the staff's general assessment, each of the alternative sites is also subject to similar ground shaking and liquefaction hazards.

ENVIRONMENTAL EVALUATION OF ALTERNATIVE SITES

For the purposes of this analysis, the elements of the project located within the boundaries of the primary site location are considered to be the same for all five alternative sites.

ALT-A

ALT-A is located southeast of the intersection of Cargo Way and Amador Street, approximately 500 feet south of Islais Creek. ALT-A is located on land reclaimed from San Francisco Bay by the placement of fill in the Islais Creek Basin. The fill

typically consists of debris and construction rubble with pieces of wood and timber and is between 20 and 40 feet thick beneath the site.

The Younger Bay Mud underlies the fill. The Younger Bay Mud comprises a soft, organic-rich, saturated clay. Borings conducted for the Geotechnical Evaluation, San Francisco Energy Project, Port Site (1994) indicate that the thickness of the Younger Bay Mud beneath the site varies 36.5 feet to 60.7 feet. The Younger Bay Mud is underlain by Bay-Side Sand and Older Bay Mud. As a result, deep pile foundations would be required for significant structures throughout the site.

The Seismic Shaking Hazard Map of California (CDMG, 1999) indicates there is a 10 percent probability that the site will be subjected to a peak ground acceleration of 0.5 to 0.6g in the next 50 years. The site is located within a liquefaction hazard zone (CDMG, 2000). No active faults are known to cross the site.

No significant paleontological resource locations and no geological resources are known to exist at the site.

ALT-B

ALT-B is located east of Arelious Walker Drive and north of Gilman Avenue, approximately 1000 feet southwest of the South Basin. ALT-B is located on land reclaimed from San Francisco Bay by the placement of artificial fill in the south basin. The fill probably consists of debris and construction rubble. The fill is believed to be underlain by variable thickness of Younger Bay Mud and Bay-Side Sand. Pile foundations would likely be required throughout the site.

The Seismic Shaking Hazard Map of California (CDMG, 1999) indicates there is a 10 percent probability that the site will be subjected to a peak ground acceleration of 0.5 to 0.6g in the next 50 years. The site is located within a liquefaction hazard zone (CDMG, 2000). No active faults are known to cross the site.

No significant paleontological resource locations and no geological resources are known to exist at the site.

ALT-C

This site is located in the City of Brisbane between Bayshore Boulevard and Highway 101, immediately northeast of the intersection of Bayshore and Geneva Boulevard. The site overlies land created when the tidal flats and marshes along the margin of San Francisco Bay were reclaimed by the placement of fill. The fill probably consists of debris and construction rubble and is believed to be underlain by variable thickness of Younger Bay Mud and Bay-Side Sand. Pile foundations would likely be required throughout the site.

The Seismic Shaking Hazard Map of California (CDMG, 1999) indicates there is a 10 percent probability that the site will be subjected to a peak ground acceleration of 0.6 to 0.7g in the next 50 years. Seismic Hazard Maps have not been completed for San Mateo County, however, the site overlies materials that have been mapped as

liquefaction hazard zones on the Seismic Hazard Maps for the City and County of San Francisco. No active faults are known to cross the site.

No significant paleontological resource locations and no geological resources are known to exist at the site.

ALT-D

This site is located in on the southern margin of Point San Bruno immediately adjacent to the South San Francisco Recycling Facility. The southern margin of Point San Bruno was reclaimed from San Francisco Bay by the placement of fill. The fill probably consists of debris and construction rubble and is believed to be underlain by variable thickness of Younger Bay Mud and Bay-Side Sand, with the bedrock that forms Point San Bruno at relatively shallow depths along the northern margin of the site. Pile foundations would likely be required throughout at least a portion of the site.

The Seismic Shaking Hazard Map of California (CDMG, 1999) indicates there is a 10 percent probability that the site will be subjected to a peak ground acceleration of 0.6 to 0.7g in the next 50 years. Seismic Hazard Maps have not been completed for San Mateo County; however, the site overlies materials that have been mapped as liquefaction hazard zones on the Seismic Hazard Maps for the City and County of San Francisco. No active faults are known to cross the site.

No significant paleontological resource locations and no geological resources are known to exist at the site.

ALT-E

This site is located at the northern end of the San Francisco Airport facility, adjacent to United Airlines' cogeneration plant. The site overlies land created when the tidal flats and marshes along the margin of San Francisco Bay were reclaimed by the placement of fill. A bedrock knob is present in the subsurface, immediately west of the ALT-E site. The fill probably consists of debris and construction rubble and is believed to be underlain by variable thickness of Younger Bay Mud and Bay-Side Sand, with bedrock at relatively shallow depths along the western margin of the site. Pile foundations would likely be required throughout most of the site.

The Seismic Shaking Hazard Map of California (CDMG, 1999) indicates there is a 10 percent probability that the site will be subjected to a peak ground acceleration of 0.6 to 0.7g in the next 50 years. Seismic Hazard Maps have not been completed for San Mateo County, however, the site overlies materials that have been mapped as liquefaction hazard zones on the Seismic Hazard Maps for the City and County of San Francisco. No faults are known to cross the site.

No significant paleontological resource locations and no geological resources are known to exist at the site.

COMPARISON OF STAFF ALTERNATIVE SITES AND THE PROPOSED SITE

Neither the proposed project nor any of the five alternative sites are expected to cause significant impacts in regard to geology, paleontology, and hydrology.

ALTERNATIVES Table A2 – Seismic Setting shows staff's assessment of the expected seismic hazards for the proposed project and of use of staff's alternative sites. None of the alternative sites offers any significant advantage with respect to seismic hazards, when compared to the proposed project.

ALTERNATIVES Table A2
Seismic Setting

Sites	Distance to San Andreas Fault (km)	Peak Ground Acceleration (g)¹	Fault Rupture Hazard	Liquefaction Hazard²
Potrero Power Plant	13.6	0.5 – 0.6	No known active fault	East half and southwest corner of site
Alternative A	12.2	0.5 – 0.6	No known active fault	Entire Site
Alternative B	10.4	0.5 – 0.6	No known active fault	Entire Site
Alternative C	8.2	0.6 – 0.7	No known active fault	Underlain by Bay Deposits
Alternative D	6.0	0.6 – 0.7	No known active fault	Underlain at least in part by Bay Deposits
Alternative E	4.8	0.6 – 0.7	No known active fault	Underlain at least in part by Bay Deposits

NOISE

SUMMARY OF PROPOSED PROJECT IMPACTS

It is technically and, typically, economically feasible to mitigate power plant noise impacts to a level of insignificance. The chief factor in determining the cost, and thus the feasibility, of this mitigation is the distance to the nearest sensitive noise receptor.³ The nearest receptors to the proposed project site are residences near 22nd Street, and in the Potrero Hill neighborhood west of Interstate 280. With the exception of the Potrero Hill residences, multi-story industrial buildings interrupt line of sight to the nearest residences. The proposed project would mitigate noise emissions to a level of insignificance at these residences.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Any federal, state and City and County of San Francisco LORS pertaining to noise will apply to ALT-A and ALT-B. Please refer to the **Noise** section for a description of these requirements.

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- 1 From CDMG Map Sheet 48, Seismic Shaking Hazard Maps of California (10% Probability in 50 Years)
 - 2 Hazard evaluation for Proposed Project and Alternative A and B the Seismic Hazard Zone Map for the City and County of San Francisco (CDMG, 2000). An equivalent map for San Mateo County does not exist.
 - 3 Sensitive receptors include residences, schools, libraries, hospitals, places of worship and any other uses for which quiet is important.

ALT-C lies within the City of Brisbane. Applicable LORS are the Noise Element of the City of Brisbane General Plan (adopted June 21, 1994), and Chapter 8.28 of the City of Brisbane Municipal Code (adopted in December 1987).

- The City of Brisbane General Plan Noise Element requires a noise attenuation or mitigation program as part of any project design, and restricts noise-producing construction activities to daytime hours.
- Chapter 8.28 of the City of Brisbane Municipal Code prohibits noise levels more than 10 dBA above the ambient noise level for a cumulative period of 15 minutes per hour, or more than 20 dBA above the ambient noise level for a cumulative period of 3 minutes per hour. This chapter exempts construction noise from the above standards during the hours of 7:00 a.m. to 7:00 p.m. weekdays, and between 9:00 a.m. and 7:00 p.m. weekends and holidays. It also limits construction noise during those hours to 86 dBA at the nearest property line.

ALT-D is located in the City of South San Francisco, and ALT-E is in South San Francisco but within the jurisdiction of the San Francisco International Airport.

LAND USES NEAR ALTERNATIVE SITES

ALT-A is an alternative presented in the Mirant AFC. The site is in an industrial area, and would not be likely to affect existing noise sensitive uses. However, the introduction of the power plant could, by virtue of noise generation, affect the feasibility of future development of nearby properties for public uses.

ALT-B is vacant land currently used as parking for 3Com Park. It is identified as a potential park site by the City/County General Plan, and is adjacent to undeveloped park property. The site is in an industrial area, and would not be likely to affect existing noise sensitive uses. However, the introduction of the power plant could, by virtue of noise generation, affect the feasibility of future development of the adjacent site for public uses.

ALT-C is in an industrial area, adjacent to a major roadway and the railroad tracks. There are no nearby existing noise sensitive uses. The zoning of the site is C-1, which could either eliminate the possibility of introducing an industrial use, or, if the land is permitted to be used as a power plant site, affect the feasibility of future development of adjacent properties for mixed uses.

ALT-D is adjacent to the City of South San Francisco recycling facility, and is in an industrial area. There are no nearby existing noise sensitive uses.

ALT-E is adjacent to the United Airlines cogeneration plant and a recently-approved peaking power generation plant. The nearest sensitive noise receptors are about 500 feet away, at a homeless shelter. The overall area is impacted by noise from aircraft operations at San Francisco International Airport.

CONSTRUCTION NOISE IMPACTS

Noise levels due to construction at the alternative sites will have to comply with applicable limits in accordance with the LORS. Staff therefore expects that construction at any of these sites will result in neither more nor less community or worker noise impacts than at the proposed project site.

PLANT OPERATION NOISE IMPACTS

Noise levels due to plant operations at any of the alternative sites will have to comply with applicable limits in accordance with the LORS. Staff therefore expects that plant operations at any of these sites will result in neither more nor less community or worker noise impacts than at the proposed project site.

SUMMARY

Alternative sites ALT-A through ALT-D do not appear to pose the potential to result in noise impacts. At ALT-E, there is the possibility of affecting residents of the nearby homeless shelter. Mitigating project noise emissions to a level of insignificance at ALT-E would probably be more costly than at the proposed site due to the proximity of the shelter.

After mitigation, no significant adverse noise impacts are expected at either the proposed site or any of the alternative sites.

HAZARDOUS MATERIALS MANAGEMENT

ANALYSIS

This analysis discusses the implications of locating the proposed Potrero Power Plant Unit 7 Project at various alternative sites with respect to hazardous materials management. Hazardous materials would be used during facility construction and operation.

CONSTRUCTION

During the construction phase of the project, the only hazardous materials proposed for use include phosphate or nitrate cleaning solutions, cleaning solvents, antifreeze, and pesticides. Any impact of spills or other releases of these materials will be limited to the site due to the small quantities involved. As long as the design of the project does not change significantly, the types and quantities of hazardous materials used during construction of the facility would not vary among sites.

OPERATION

In general, the identity, amount, handling, and storage of hazardous materials during facility operations is a function of facility design and not the location of the site. Therefore, the choice of an alternative site will not affect hazardous materials usage during operations. However, the impacts of an accidental release may be different at different sites due to the location and density of residential and commercial development in the area. Additionally, hazardous material

transportation routes may differ and thus may have a different potential for impacts in the community.

Accordingly, staff qualitatively evaluated each alternative site in terms of its level of impacts which could be expected if an accident occurred involving either an on-site hazardous material spill or an off-site transportation accident resulting in a hazardous material spill.

For example, the area surrounding a proposed facility in which a person residing, working, or traveling through might experience exposure at a level where they could become injured by a chemical spill is termed the Vulnerability Zone (VZ). For the storage of aqueous ammonia at the proposed Potrero Power Plant Unit 7 Project, the VZ is approximately 162 feet from the aqueous ammonia storage tanks when the proposed spill containment methods are used. This distance is not site specific but rather is general for the type of facility and the methods of use, handling and spill containment proposed by the applicant. Thus, they would be the same for any of the alternative sites listed. Because the VZ does not reach beyond the facility fence line, no off-site impacts would be expected to occur at any alternative site as a result of an on-site accidental release of aqueous ammonia. Because staff has determined that the greatest potential for an accidental release of a hazardous materials involves the release of aqueous ammonia, the risk of off-site impacts from the accidental release of any other hazardous material stored on-site is even lower.

The transportation of hazardous materials over city streets to the facility presents a potential for impacts if an accident and spill occurs. Staff's analysis found that this potential can be mitigated to a level of insignificance. However, in comparing alternative sites, those which require substantial hazardous materials travel through a residential or commercial community present a greater potential for impacts than those sites where travel would be primarily through industrial areas.

The assessment of the potential for impacts on people at each alternative sight was compared qualitatively to the potential for impacts at the preferred site by indicating if the alternative site would be the same, inferior, or superior to the preferred site.

Site ALT-A on Cargo Way, San Francisco, is a 5-acre vacant lot owned by the Port of San Francisco. The distance to the nearest residence is 5-6 blocks. The hazardous materials transportation route would consist of ~2 miles from Highway 101 (a little less if the transport vehicle exits from Interstate 280) mostly through commercial and industrial areas but with some residences along the route. This site is deemed **inferior** to the proposed site due to the proximity of homes to the transportation route.

Site ALT-B is located on Gilman St. in San Francisco across from 3-Com Park. It is presently vacant and used for parking during professional football games. Homes are located 2 blocks to the west and an RV storage area borders the site on the east. The transportation route from Highway 101 is either 1.2 miles from the northwest via 3rd Street and Gilman Ave. or 1.8 miles from the southwest via Harney Way, Jamestown Ave., and Hunters Point Expressway, and then into Gilman for about 3 blocks. Third Street is heavily commercial and Gilman is totally residential.

Harney Way is mostly bay-front and commercial but with one notable large condominium complex. Jamestown Ave., the Hunters Point Expressway, and most of the Gilman Ave. route into the facility is bordered by bay-front, park, or 3-Com Park parking lots. This site is deemed **inferior** to the proposed site due to the proximity of homes to the facility site and to the transportation route.

Site ALT-C is located on a vacant portion of a parcel in the City of Brisbane. Residences are located 2-3 blocks to the west across Bayshore Blvd. The transportation route from Highway 101 would be through industrial, commercial, or open spaces areas. This site is deemed **equal** to the proposed site due to the lack of proximity to homes to the site and to the transportation route.

Site ALT-D is a flat, vacant site located in a general industrial area in South San Francisco. It is adjacent to SF Bay and to a recycling operation. A home is located a little over ½ mile to the north. The transportation route would be ~1.6 miles from Highway 101 through industrial and commercial areas. This site is deemed **equal** to the proposed site due to the lack of proximity of homes to the site and to the transportation route.

Site ALT-E is located at the north end of San Francisco Airport, on the North Access Road adjacent to the United Airlines cogen plant. The nearest residence is 10 blocks away but the Safe Harbor homeless shelter is located 500 feet to the north across the North Access Road. Also located there is the SamTrans bus storage lot and some administrative buildings. The transportation route would be ~1/2 mile from Highway 101 - Interstate 380 continuation off-ramp to the North Access Road. The North Access Road is bordered on the south by an industrial area (United Airlines facility) and open space/wetlands to the north. This site is deemed **superior** to the proposed site due to the lack of proximity of homes to the site and the transportation route.

SUMMARY

Staff has concluded in the **HAZARDOUS MATERIALS MANAGEMENT** section of the Staff Assessment that the proposed project would not be likely to cause any significant adverse impacts from hazardous materials use, storage, or transportation.

The quantity and types of hazardous materials due to project operation would not differ between the alternative sites and the proposed site. Minor differences exist in proximity of residences to the sites and residences along the likely transportation route.

Staff concludes, that using the above qualitative approach, Alternative Sites **A** and **B** are **inferior** to the proposed site due to the proximity of homes to the facility site and to the transportation route. Staff finds that Alternative Sites **C** and **D** are **equal** to the proposed site due to the lack of proximity of homes to the site and to the transportation route. Staff also finds that Alternative Site **E** is **superior** to the proposed site due to the lack of proximity of homes to the site and the transportation route.

SOCIOECONOMICS

PURPOSE OF THE ANALYSIS

The purpose of this analysis is to compare alternative sites to the Applicant's Potrero Power Plant site in terms of expected socioeconomic impacts. Please refer to the **Socioeconomics** section of this document which evaluates the likely socioeconomic impacts from the use of the Potrero Power Plant site.

This alternative site analysis did not evaluate consistency with applicable LORS because this was a screening level socioeconomic analysis.

PROJECT AND ALTERNATIVE SITES EVALUATION

Five alternative sites have been considered. Each of the sites would require the same construction labor force and would draw from the same labor supply. As with the proposed project, the employment, housing, and schools impacts of the construction and permanent labor force would not be significant because of the size of the Bay Area economy.

ALT-A: CARGO WAY, SAN FRANCISCO

Impacts on neighborhoods would be comparable to the proposed project, with housing located 5-6 blocks from the site. However, development at this site would require an additional site dedicated to power generation, a site that could not be used for economic uses that might generate more jobs in a district of San Francisco in great need for more employment opportunities. Impacts on utilities, emergency services, and public finance would be comparable, as the service agencies would be the same.

Relative to the project site, the closest neighborhoods are lower income and higher proportion minority, and there is a significant population subject to environmental justice concerns.

ALT-B: GILMAN SITE, SAN FRANCISCO

Impacts on neighborhoods would be greater than that of the proposed project, with housing located within two blocks of the site. Development at this site would require an additional site dedicated to power generation, a site that could not be used for the park purpose for which it is designated. As a low income, minority community, a change in future land use from park to power plant would be a significant adverse impact on the neighborhood. Impacts on utilities, emergency services, and public finance would be comparable, as the service agencies would be the same.

Relative to the project site, the closest neighborhoods are lower income and higher proportion minority, and there is a significant population subject to environmental justice concerns.

ALT-C: TUNTEX SITE, CITY OF BRISBANE

Impacts on neighborhoods would be greater than that of the proposed project, with housing located within two blocks of the site. Development of a power plant at this site would require a change from an area zoned for job producing commercial uses. To an adjacent low income, minority community, a change in future land use from commercial to power plant would represent a significant adverse impact on the neighborhood. Utility, emergency services, and public finance impacts would be somewhat comparable, although the service agencies would differ in some cases. As a smaller city, Brisbane would receive greater relative property tax benefits from the project.

Relative to the project site, the closest neighborhoods are lower income and higher proportion minority, and there is a significant population subject to environmental justice concerns.

ALT-D: EAST JAMIE COURT, CITY OF SOUTH SAN FRANCISCO

Impacts on neighborhoods would be less than the proposed project, with no housing located within a half mile of the site. Development at this site would require an additional site dedicated to power generation, but is located adjacent to a municipal recycling facility and other industrial uses. Impacts on utilities, emergency services, and public finance would be comparable, although the service agencies would be different than in San Francisco.

Relative to the project site, neighborhoods are farther away and do not have the proportion of low income and minority population.

ALT-E: UNITED GOLDEN GATE SITE, SAN FRANCISCO INTERNATIONAL AIRPORT

Impacts on neighborhoods would be less than the proposed project, with no housing located within 10 blocks of the site (with the exception of a homeless shelter 500 feet north). Development at this site would be adjacent to the United Airlines Cogeneration Plant and a recently approved 51 MV peaker plant. Impacts on utilities, emergency services, and public finance would be comparable, although the service agencies would be different than in San Francisco.

Relative to the project site, neighborhoods are farther away and do not have the proportion of low income and minority population.

CONCLUSION

In the area of Socioeconomics, staff has concluded that the proposed project will not result in any significant adverse socioeconomic impacts if it is located at the Potrero site. Consequently, in the area of Socioeconomics, there is no reason to locate the project at an alternative site since there are no significant adverse socioeconomic impacts to reduce or eliminate. Locating the project at ALT-B (the Gilman site in San Francisco) or ALT-C (the Tuntex site in Brisbane) would quite possibly result in significant adverse socioeconomic impacts because of neighborhood proximity and taking sites proposed for neighborhood serving recreational and retail commercial needs, respectively.

ALTERNATIVES Table A3
Summary of Alternative Sites for Socioeconomic Resources

Alternative Sites	Comparison with Potrero Site
ALT-A: Cargo Way	Greater impacts
ALT-B: Gilman Site	Greater impacts
ALT-C: Tuntex Site	Greater impacts
ALT-D: East Jamie Ct. Site	Lesser impacts
ALT-E: SF Airport Site	Lesser impacts

SOIL AND WATER RESOURCES

PURPOSE OF THE ANALYSIS

The purpose of this analysis is to compare five (5) alternative sites analyzed by the Energy Commission staff to Mirant's proposed site at the Potrero Power Plant. The Potrero Power Plant is located east of Illinois Street between 22nd Street and 23rd Street. This analysis is on the basis of impacts to soil and water resources. Please refer to the **Soil and Water Resources** section of this Staff Assessment, which evaluates the impacts to soil and water resources from the use of the existing Potrero Power Plant site.

APPLICABLE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Any federal, state, and local LORS pertaining to soil and water resources would apply to Alternative sites ALT-A and ALT-B. ALT-C is located in the City of Brisbane, San Mateo County; ALT-D is located in the City of South San Francisco, San Mateo County; and ALT-E is located at the property of the San Francisco International Airport (SFIA).

According to Tim Tune (Senior Planner for the City of Brisbane), ALT-C will need to obtain a grading permit via the Public Works Department. Site drainage is covered under this permit. Tim also mentioned that because ALT-C is located in the vicinity of a nearby landfill, the County of San Mateo might have provisions related to earthmoving.

Richard Harmon (City of South San Francisco Public Works Department – Engineering Division) indicated that ALT-D would need a grading permit. The grading permit is modeled after the California Uniform Building Code.

Richard indicated that the Water Quality Control Division will require a copy of the Applicant's Storm Water Pollution Prevention Plan as part of the overall NPDES program. The Standard Urban Storm Water Mitigation Plan (SUSMP) is part of the overall NPDES Stormwater program that is administered by the California Regional Water Quality Control Board (CRWQCB). The CRWQCB requires all cities to update existing stormwater programs in an effort to update existing legal authority to enforce the SUSMP provisions of the permit. The permit for the ALT-D is considered a joint permit, with the County of San Mateo as the Principal Permittee and the City of South San Francisco as the Permittee. This area-wide NPDES

municipal stormwater permit is designed to attain water quality objectives and protect the beneficial uses of receiving waters.

The SUSMP is part of the municipal stormwater program that serves as a model for the City of South San Francisco to address stormwater pollution from new development and redevelopment projects. All persons engaging in earthmoving activities are required to demonstrate proof of compliance regarding Stormwater discharge requirements mandated by the Regional Water Quality Control Board. The City of South San Francisco is to ensure that Best Management Practices (BMPs) are implemented to reduce pollution from stormwater runoff during pre and post construction activities.

ALT-E would be located on San Francisco International Airport property and therefore subject to the San Francisco International Airport Tenant Improvement Guide. The guide provides provisions, regulations and procedures related to discharge. Provisions for grading operations contain Articles that state a permit must be obtained prior to the commencement of work, which may be part of the General Tenant Permit request.

In the event that potential contaminated soils/groundwater be encountered at ALT-C, ALT-D, and ALT-E sites, the Applicant needs to comply with LORS associated with the County of San Mateo Health Department

SUMMARY OF PROPOSED PROJECT IMPACTS

The proposed Unit 7 project will require three water systems: plant cooling; process, and domestic uses. Additionally there will be a waste discharge system for all plant wastewater.

Most of Unit 7's water demands would be required for plant cooling purposes. Assuming the plant utilizes cooling water from the San Francisco Bay there will be a requirement of 158,000 gpm. This would require the construction of a new intake structure that would include screens, pumps, piping, as well as a discharge system.

Process and domestic water uses for the project are proposed to be supplied by the local water agency. Process water that would be required for the steam cycle will use treated potable water in the process to create steam in the heat recovery steam generator to drive the steam turbine. There will be make up required to the steam cycle to replace losses as well as water that is blown down to maintain purity. Potable water will also be used for makeup to the combustion turbine evaporative coolers, equipment wash, and miscellaneous in plant uses. Domestic water for plant personnel and sanitary use will also be required. The process water requirements will have an annual average requirement of 36 gpm, the evaporative coolers 50 gpm during the summer months, and the domestic requirements of 2 gpm.

In addition to the cooling water discharge, wastewater streams will be generated in the plant from blowdown from the heat recovery steam generators, the evaporative coolers, equipment wash water, floor drains and sanitary wastes. Storm water is

also considered a wastewater, which during periods of heavy rains could generate measurable flows. The water treatment system for the process makeup to the heat recovery steam generators would normally have a waste discharge however the applicant has proposed to use vendor supplied units that will regenerate the treatment facilities off site and discharge the wastes under the vendors existing permits.

With the exception of the cooling water, which will be discharged to the San Francisco Bay, the other waste streams will be treated and either discharged to the bay or to the local sewer. The plant will collect waste streams that may contain oil contamination and treat them in an oily-water separator prior to discharge. The oil collected will be trucked to an approved disposal facility. Wastewater from plant equipment wash that may contain heavy metals will be collected and disposed of offsite. The applicant estimates the maximum waste water discharges to be 158,000 gpm to the bay from the cooling water system; 25 gpm to the bay from the evaporative cooler blowdown; 76 gpm to the bay from the heat recovery steam generator blowdown; 81 gpm to offsite disposal from equipment washes; 10 gpm to the sewer from plant drains; 20 gpm to the sewer from sanitary wastes; 500 gpm to the sewer from stormwater runoff; and 270 gpm of treated effluent to the sewer from the oily water separator.

EVALUATION OF ALTERNATIVE SITES

ALT-A, CARGO WAY

The Cargo Way site is located south of Islais Creek Channel between Cargo Way and Amador streets. A new cooling water intake structure and discharge would be required similar to that for the Potrero Unit 7 site. There would be an increased capital and pumping cost for the intake and discharge due to the additional distance that the Cargo Way site is located from the San Francisco Bay. This could potentially be reduced if the cooling water could be drawn from the Islais Creek. The route of the cooling water pipe to the bay would be approximately 2200 feet and to the creek a distance of 200-300 feet. Water for process and domestic uses would be obtained from the City of San Francisco as proposed for the Potrero Unit 7 site. Wastewater would be handled in a similar manner as the proposed site by being discharged to the local sewer.

ALT-B, GILMAN SITE

The Gilman site is located just north of Gilman Avenue and east of Aurelius Walker Drive on the Candlestick Point. A new cooling water intake structure and discharge would be required similar to that for the Potrero Unit 7 site. The Gilman Site is located approximately 500 feet from the South Basin of the San Francisco Bay and would therefore require additional capital and increased pumping cost compared to the proposed site location. The cooling water discharge would most likely not be directed to the South Basin, as this would tend to impact the water temperature of the intake due to the confined nature of the basin. Therefore, the discharge would most likely require additional pipe to reach the bay that is located 1,100 to 1,200 feet from the plant site. Water for process and domestic uses would be obtained from the City of San Francisco as proposed for the Potrero Unit 7 site. Wastewater

would be handled in a similar manner as the proposed site by being discharged to the local sewer.

ALT-C, TUNTEX SITE

The Tuntex site is located in San Mateo County in the City of Brisbane just Northeast of the intersection of Geneva Avenue and Bayshore Blvd. This alternative is located the furthest from the San Francisco Bay, a distance of approximately 1500 to 1800 feet, making it the site with the greatest impacts associated with the use of the By as a source for cooling water. Additionally, to reach the By the cooling water pipes must cross three railroad lines and as well as several roadways including Highway 101. Therefore at this location the use of cooling towers would be considered (see Cooling Water Alternative discussion below). Water for process and domestic uses would be obtained from the City of Brisbane, which acquires its water from the City of San Francisco. Although the additional water requirements for this plant may impact the City's water system, it is assumed that expansion or new waterlines could be built to provide for the additional requirements. Wastewater would be handled in a similar manner as the proposed site by being treated and discharged to the local sewer that is operated by the City of San Francisco.

ALT-D, EAST JAMIE COURT SITE

The East Jamie court Site is located in South San Francisco in Mateo County on the San Francisco Bay south of East Jamie Court and east of Haskins Way. A new cooling water intake structure and discharge would be required similar to that for the Potrero Unit 7 site. Water for process and domestic uses would be obtained from the California Water Company that serves the City of South San Francisco. Wastewater would be handled in a similar manner as the proposed site by being treated and discharged to the local sewer that is operated by the City of South San Francisco.

ALT-E, UNITED GOLDEN GATE (UGG) SITE

The UGG site is located near the San Francisco International Airport. It is south of the North Access road. A new cooling water intake structure and discharge would be required similar to that for the Potrero Unit 7 site. The Gilman Site is located approximately 700 to 800 feet from the San Francisco Bay and would therefore require additional capital and increased pumping cost compared to the proposed site location. Water for process and domestic uses would be obtained from the California Water Company that serves the City of South San Francisco. Wastewater would be handled in a similar manner as the proposed site by being treated and discharged to the local sewer that is operated by the City of South San Francisco.

COOLING WATER ALTERNATIVES

The State Water Resources Control Board's Policy 75-58 states in part "fresh inland waters should only be used for power plant cooling if other sources or methods of cooling would be environmentally undesirable or economically unsound." This policy states that power plant cooling water should, in order of priority, come from

wastewater being discharged to the ocean, ocean water, brackish water from natural sources or irrigation return flow, inland waste waters of low total dissolved solids, and other inland waters.

WET COOLING TOWERS

Wet cooling towers act as heat exchangers taking water that is used to condense steam from the steam turbine cycle and expose it to the air to remove the heat that has been absorbed. A portion of the water is evaporated in the cooling process and the remainder is collected and recycled back to the steam condenser. The use of wet cooling towers rather than a once through cooling system that uses water from the San Francisco Bay would require make up water to replace that lost through evaporation. Also as water is evaporated from the cooling tower the minerals in the water concentrate and will form scale that inhibits the operation of the cooling tower. To control the water quality of the cooling tower a portion of the water is blowdown and replaced with fresh makeup water. The make up water would be supplied by either the local water agency or from a wastewater treatment facility. The use of potable water as a source of makeup to the cooling tower is less preferable than a once through cooling system using water from the bay. During ambient conditions with high humidity levels the wet cooling tower would produce a vapor plume that would be visible in the area.

DRY COOLING AND WET/DRY COOLING

In some cases dry cooling systems are a technically feasible alternative to wet cooling. These systems use less water and eliminate the occurrence of visible vapor plumes. However, these systems require a large area (approximately 1.5 acres), are less efficient in rejecting heat, and generally require more electricity and create higher pressure in the steam turbine condenser. These factors decrease the thermal efficiency and power output of the plant. In addition, capital costs of dry cooling systems are two to four times as much as wet cooling systems.

RECLAIMED WATER SUPPLY AND WASTEWATER

The Tuntex Site (ALT-C) would most likely require the use of cooling towers due to its greater distance to the Bay. Using reclaimed water from waste water treatment facilities would be preferable to potable water as a source of make up to wet cooling towers. Depending on the quality of the reclaimed water, the requirements of the plant would range between 2.9 and 4.4 million gallons per day (mgd). Effluent or blowdown from the cooling towers would be returned to the wastewater treatment plant either through the sewer system or through a dedicated pipeline. The City and County of San Francisco's Southeast Water Pollution Control Plant would most likely provide reclaimed water. The effluent from the water treatment plant is currently treated to secondary standards and would require further treatment to be used in a cooling tower application. This plant is located about 2.5 miles from the Tuntex Site and would require a new pipeline for delivery of the cooling tower makeup water.

EROSION / SEDIMENTATION AND STORMWATER

An erosion and sediment control plan would be needed as part of the Stormwater Pollution Prevention Plan (SWPPP) at any alternative site. This plan would provide mitigation for any potential impacts resulting from erosion. The SWPPP is part of the provisions set forth in the NPDES permit requirements that is required for the construction and operation of the project. Impacts related to erosion and stormwater would be essentially the same for each of the alternative sites as for the proposed project.

CONTAMINATED SOILS / GROUNDWATER

Although soil and groundwater contamination is evident at ALT-C, project development at the other alternative sites may also encounter potential soils/groundwater contamination. The Applicant would need to provide a site analysis and a remediation plan as well as meet any LORS pertaining to state and local agencies prior to the commencement of construction. From a soil and water resource standpoint, the remediation of existing contaminated soil and groundwater is a benefit. The Applicant will also need to meet any provisions/permits regarding the handling and disposal of any contaminated materials during construction. For further discussion of site contamination issues, refer to the Waste Management and Public Health discussions in this Alternatives Section.

SUMMARY

ALT-A (Cargo Way) and ALT-B (Gilman) would be very similar to the proposed project in regard to a power plant's water needs, available water supplies, and wastewater discharge impacts and offer no advantages over the proposed project site.

A power plant at ALT-C (Tuntex) could possibly use reclaimed water as cooling tower makeup thereby reducing any impacts on the San Francisco Bay due to the cooling water intakes and discharge. However, the installation and expense to operate the delivery system required for the reclaimed water would cause significant construction and economic impacts along with the visual impact of the cooling tower vapor plume. Therefore, from a water supply consideration this site is less desirable than the proposed Unit 7 site.

Site ALT-D (East Jamie Court) and ALT-E (UGG) would both be very similar to the proposed Unit 7 site by using a once through cooling system that intakes and discharges to the San Francisco Bay. The California Water Company would provide other in plant water uses and the wastewater would be discharged to the City of South San Francisco's sewer. Therefore, from the perspective of water use, water supply, and wastewater disposal, sites D and E offer no significant advantage over that of the proposed Unit 7 site.

TRAFFIC AND TRANSPORTATION

The purpose of this analysis is to compare alternative sites to the Applicant's Potrero Power Plant site in terms of expected traffic and transportation impacts.

ALT-A: CARGO WAY, SAN FRANCISCO

This site is located on the west side of Cargo Way south of the proposed site. This site would basically use the same freeways and roadways associated with the proposed site. The major difference would be that more of the construction traffic workforce would have to use Third Street to get to the site from either Army Street or Evans Street. The construction traffic associated with this project and the construction associated with the Third Street Light Rail Project could increase traffic congestion on Third Street. Therefore, this site is deemed inferior to the proposed site.

ALT-B: GILMAN SITE, SAN FRANCISCO

The Gilman site is located across from 3-Com Park on Gilman Street. The access to this site would require the use of Third Street. There are some limits on truck traffic along Third Street in the area of this site. Trucks weighing more than 11,000 pounds are prohibited on Third Street between Evans Avenue and Carroll Avenue and no through trucks are allowed on Third Street between Jamestown Avenue and Jerrold Avenue. The limitation on truck traffic makes this site inferior to the proposed site.

ALT-C: TUNTEX, CITY OF BRISBANE

The Tuntex site is located West of US 101 with Bayshore Boulevard being the primary exit. The site can be accessed from Bayshore Boulevard west of the site or Tunnel Avenue east of the site. The site is located in an industrial area; however, Tunnel Avenue traffic is primarily residential and local commercial. The site is not accessible to port facility and/or direct rail service. Therefore, the site is deemed to be inferior to the proposed site.

ALT-D: EAST JAMIE COURT, CITY OF SOUTH SAN FRANCISCO

This site is located in an industrial area in South San Francisco adjacent to a recycling operation and San Francisco Bay. The area is a mixture of industrial, commercial and open space. It is approximately 1.5 miles from US 101. Traffic in the site area is predominantly associated with commercial and industry operation. Therefore, the impact of construction traffic may not have a significant impact on local traffic flow. The site is deemed to be equal to the proposed site, from the traffic and transportation perspective.

ALT-E: UNITED GOLDEN GATE SITE, SAN FRANCISCO INTERNATIONAL AIRPORT

This site is located east of US 101. The site is located at the north end of San Francisco Airport, on the North Access Road. It is adjacent to the United Airlines Cogen plant. There is a large long-term parking lot in the area. This area is predominantly industrial with no nearby residential areas. The area has heavy truck activity. The local roadways do have a high level of traffic activity. The area lacks rail service and no port facilities are available.

The site location is in an industrial area with no nearby residential area. The construction truck activity would have limited impact on the area but the high level of traffic on the local roadways could be disruptive. Given the industrial activity in the

area and lack of residential traffic the site is deemed to be equal to the proposed site, from the traffic and transportation perspective.

VISUAL RESOURCES

SUMMARY

Staff does not expect the ALT-A, ALT-D, or ALT-E sites to result in significant visual impacts. However, it is anticipated that the ALT-B and ALT-C sites would cause significant and unavoidable adverse visual impacts.

ALT-A CARGO WAY, SAN FRANCISCO

Site ALT-A is located at the southwest corner of Cargo Way at Amador Street on land owned by the Port of San Francisco. The site is presently undeveloped and is adjacent to and south of the old Continental Grain Terminal. To the east is the Intermodal Container Transfer Facility. To the south of the site is the India Basin Industrial Park. To the west is vacant land that is generally used for storage. The landscape in the immediate vicinity of the site is dominated by the grain terminal and to a lesser extent, the maritime industrial facilities of the Port of San Francisco's North and South Container Terminals, and Intermodal Container Transfer Facility. Also visible in views of the project vicinity is the industrial and commercial development along 3rd Street to the west of the site and the large communications tower to the east of the site.

The overall visual quality of the immediate project site is low, reflecting the influence of complex industrial appearance of the grain terminal and the maritime industrial and storage uses in the immediate project vicinity. However, the presence of the tall, massive grain terminal with its complex forms and strong vertical lines creates the opportunity for a moderate degree of visual absorption in what would otherwise be an industrial landscape dominated by relatively low, horizontal, geometric structures. Viewer sensitivity is rated moderate and reflects the offsetting values of low viewer sensitivity in the commercial and industrial areas immediately adjacent to the site and high viewer sensitivity for the residential areas south of the site on the north side of Hunters Point and west of the site on the east and south slopes of Potrero Hill. Viewer exposure would be high, reflecting the foreground proximity of the site to the extended viewing opportunities from the higher elevation residential areas of Hunters Point and Potrero Hill and the numerous viewing opportunities along the 3rd Street commercial corridor. The project would also be visible to some of the north-facing, upper floors in the India Basin Industrial Park. The resulting overall visual impact susceptibility would be moderate.

Use of the ALT-A site for a power plant would result in the introduction of linear and geometric block forms of industrial character that would be similar to the adjacent industrial facilities such as the grain terminal and the container transfer facility. The resulting visual contrast would be low-to-moderate when viewed from nearby viewing locations and more distant viewpoints of Hunters Point and Potrero Hill. The power plant would be a prominent visual element in the Port of San Francisco's maritime industrial area and would appear co-dominant with the adjacent grain terminal. The power plant would result in a low degree of view blockage of other

industrial and commercial uses. The overall severity of the visual impact would be low-to-moderate. In the context of the site's overall moderate visual impact susceptibility, the resulting visual impact would be considered adverse but not significant.

ALT-B 3Com PARK AREA: GILMAN SITE

Site ALT-B is located in a level, vacant lot east of Arelious Walker Drive and north of Gilman Avenue, immediately north of 3Com Park. The site is presently used for overflow parking for 3Com Park and has the general appearance of a site that has been abandoned for some time. To the east of the site is the Candlestick RV Park and Candlestick Point State Recreation Area. To the south is 3Com Park with elevated residential areas on the hill slopes to the west of the park. To the immediate west of the site is a residential area. To the immediate north of the site are Bay wetlands and more residential areas on the southern slopes of Hunters Point. More distant views of the site are afforded to residential areas at higher elevations west of Highway 101.

Overall visual quality is low due to the site's somewhat dilapidated state. Visual absorption capability of the existing landscape is also low given the level terrain and the general absence of large structures in the immediate vicinity of the site north of Gilman Avenue. Viewer sensitivity is high as a result of the close proximity of residences to the southwest, west and north, and visitors to Gilman Park to the south and the State Recreation Area to the east. Viewer exposure would be high given the numerous foreground to middleground viewing opportunities from all directions. The overall susceptibility of the site to significant visual impacts is considered moderate-to-high.

The power plant would introduce a high level of visual contrast into the viewshed given the general absence of comparable structures with similar visual characteristics. The power plant would be the dominant feature in the foreground to middleground landscape while view blockage of wetland and Bay landscapes would be moderate. The severity of the resulting visual impact would be high and the visual impact is considered significant and unavoidable.

ALT-C TUNTEX SITE, CITY OF BRISBANE

The ALT-C site is located immediately northeast of the intersection of Bayshore Boulevard and Geneva Boulevard, in the center of Visitation Valley. The site is located northeast of Martin Substation on a level, vacant parcel. To the north of the site are non-operating commercial/industrial facilities including the old Pacific Lithograph Printing Company. To the east of site are industrial facilities including resource recovery operations. To the south of the site is vacant land that is contaminated with hydrocarbons. To the west of the site are commercial and service commercial uses along Bayshore Boulevard and Geneva Avenue. Also within viewing distance of the site is the Cow Palace event facility.

The existing visual quality in the immediate vicinity of the site is low due to the prominence of the existing electric transmission infrastructure south of the site and the adjacent and nearby commercial, light-industrial, and heavy industrial uses.

However, when viewed from the surrounding ridges that define Visitation Valley on the south, west, and north sides, visual quality is moderate-to-high with panoramic vista views over the Bayshore lowlands of the valley bottom to Candlestick Point and San Francisco Bay beyond. Visual absorption capability of the existing landscape is low given the absence of structures with similar character or vertical scale. Viewer sensitivity from nearby commercial and industrial uses is low while the viewer sensitivity for motorists on Geneva Avenue and Bayshore Boulevard is considered moderate. Viewer sensitivity is considered high at McLaren Park and the residential neighborhoods to the north and west and along the northern slopes of San Bruno Mountain to the southwest. Overall viewer sensitivity is rated moderate-to-high. Viewer exposure is also rated high given the site's foreground to middleground viewing distance and central position in the viewsheds from the numerous residential areas to the north, west, and south of the site. The site would also be highly visible as a foreground visual element in views from northbound and southbound Bayshore Boulevard and eastbound Geneva Avenue. Overall visual impact susceptibility is considered moderate-to-high.

There are few structures of substantial height in the project vicinity, as most facilities exhibit a characteristic low, rectangular form with horizontal lines being more prominent than vertical. Therefore, the power plant would introduce a high level of visual contrast into the viewshed given the general absence of structures with similar visual characteristics. The power plant would be a co-dominant to dominant feature in the foreground to middleground landscape when viewed from the higher elevation residential areas and surrounding hills and ridges, including McLaren Park. View blockage of wetland and Bay landscapes would be moderate when viewed from these elevated perspectives. The severity of the resulting visual impact on views within Visitation Valley would be high and the visual impact would be significant and unavoidable.

ALT-D SOUTH SAN FRANCISCO: EAST JAMIE COURT

The ALT-D site is located south of East Jamie Court and east of Haskins Way, in the industrial park area south of East Grand Avenue. The site is located on a level, vacant parcel that appears to be partially used for equipment storage. To the immediate north of the site is a Yellow Freight Systems facility. To the east of the site are industrial facilities including a recycling center. To the south are Bay wetlands while west of the site is an industrial park development. Also, at a higher elevation and within a foreground viewing distance of the site (though with limited views), are the office buildings to the north known as "The Courtyard" at 383/393 East Grand Avenue and the Hilltop Business Center on Grandview Drive.

The existing visual quality in the immediate vicinity of the site is low due to the abandoned nature of the site and the prominence of the nearby industrial and light industrial uses. However, when viewed from more distant, higher elevation residential areas to the north, west, and southwest of the site, landscape visual quality appears more moderate given the panoramic vistas over the highly urbanized near Bay lowlands to the expanse of San Francisco Bay and the East Bay Hills beyond. Visual absorption capability of the existing landscape is moderate due to the industrial character of the immediate vicinity and the presence of the

industrial structures to the east of the site. When viewed from greater distances, the higher topography of nearby San Bruno Point appears in close proximity to the project site and would provide sufficient mass to partially balance the introduction of the new plant facilities. Viewer sensitivity from nearby commercial and industrial uses is low while the viewer sensitivity would be high for the more distant residential neighborhoods to the north of the site at the base of San Bruno Mountain in South San Francisco. Overall viewer sensitivity is rated moderate-to-high. Viewer exposure is rated moderate given the site's foreground-to-distant middleground viewing distances from the residential areas to the north, west, and southwest of the site. The residential neighborhoods to the north are approximately one mile distant. The elevated residential areas to the west and southwest are up to two and one-half miles from the site. From the northern residential viewing areas, views tend to be oriented to the southeast in the general direction of the airport. The ALT-D site would not be in the center of views from these locations. The more distant residential viewing locations to the west and southwest of the site would generally be oriented to the east in the direction of the airport, which is located approximately mid-point in the viewshed extending from San Bruno Point in the north to San Mateo Point or Coyote Point in the south. The ALT-D site is located to the north of the center of the view, adjacent to San Bruno Point. Overall visual impact susceptibility is considered low-to-moderate.

Given the presence of similar structural forms and lines associated with the industrial facilities and recycling center immediately adjacent and to the east of the ALT-D site, the power plant would introduce a low-to-moderate level of visual contrast into the existing viewshed. The power plant would appear co-dominant with the recycling center and prominent land mass of San Bruno Point when viewed from residential areas located one to two and one-half miles distant. View blockage of Bay landscapes would be low-to-moderate when viewed from these elevated perspectives. The severity of the resulting visual impact would be low-to-moderate and the visual impact would be adverse but not significant.

ALT-E SF AIRPORT: UNITED GOLDEN GATE (UGG) SITE

The ALT-E site is located south of North Access Road adjacent to the United Airlines cogeneration plant and maintenance facilities. To the east, south, and west of the site are airport facilities. To the north of the site are additional airport facilities, shoreline wetlands, and a homeless shelter.

The existing visual quality in the immediate vicinity of the site is low due to the industrial nature of the adjacent maintenance, fueling, and cogeneration facilities. Visual absorption capability of the existing landscape is moderate-to-high as a result of the industrial character and substantial mass of the adjacent structures. Viewer sensitivity from nearby commercial and industrial uses is low while the viewer sensitivity would be high for the more distant residential neighborhoods to the north of the site at the base of San Bruno Mountain in South San Francisco. Overall viewer sensitivity is rated moderate-to-high. Viewer exposure is rated moderate given the site's middleground viewing distance and its central position in the viewshed that generally extends from San Bruno Point in the north to San Mateo Point or Coyote Point in the south. The residential neighborhoods to the north are

slightly over one mile distant (located north of downtown South San Francisco). The elevated residential areas to the west and southwest are up to two and one-half miles from the site. From the residential viewing areas to the north, views tend to be oriented to the southeast in the general direction of the site. The site would appear in the center of views from these locations. The more distant residential viewing locations would generally be oriented to the east, again in the direction of the site and airport which is located approximately midway between San Bruno Point and Coyote Point. Overall visual impact susceptibility is considered moderate.

Given the presence of similar structural forms and lines associated with the airport maintenance and fueling facilities and cogeneration plant immediately adjacent to the ALT-E site, the power plant would introduce a low-to-moderate level of visual contrast into the existing viewshed. The power plant would appear co-dominant with the existing airport facilities when viewed from residential areas located one to two and one-half miles distant. At these distances, view blockage of the Bay and Coyote Point (when viewed from the north) would be low. The severity of the resulting visual impact would be low-to-moderate and the visual impact would be adverse but not significant.

CONCLUSIONS

Visual impacts of ALT-A, ALT-D, and ALT-E would be adverse but not significant. ALT-B and ALT-C would create significant and unavoidable visual impacts due to the local settings and the high degree of visibility that a power plant would have in these locations.

WASTE MANAGEMENT

ANALYSIS

Hazardous and nonhazardous wastes would be generated during facility construction and operation. This analysis discusses the waste management implications of locating the proposed Potrero Power Plant Unit 7 Project at selected alternative sites compared to the proposed site.

CONSTRUCTION

Wastes generated during project construction include those related to site preparation as well as construction of the facility. As long as the design of the project does not change significantly, the types and quantities of wastes generated from construction of the facility itself would not vary substantially among sites.

Wastes generated during site preparation would vary according to the extent of contamination which might exist, the need to remove existing structures, and contamination which could exist along the length of linear facilities. Potential sources of site-specific contamination could include existing on-site landfills, unauthorized dumping, spills from hazardous materials containers being transported over or temporarily parked at the site, and migration of chemicals from nearby leaking tanks or waste sites. Even though a site may appear to be vacant with no

evidence of contamination, an investigation is necessary to assess the likelihood of possible contamination.

IMPACTS AT THE PROPOSED UNIT 7 SITE

The proposed site contains a group of structures known as the Station A complex, which will be removed prior to Unit 7 construction. Removal of foundations and other belowground structures are included as part of the proposed project. Concentrations of nickel, chromium, and lead were found in excess of regulatory levels at all depths throughout the excavation footprints. Staff did not conclude that there would be any significant waste management related impacts associated with site preparation for the Unit 7 project.

The potential for contamination along linear routes associated with each alternative is unknown without a site-specific assessment. However, the existence of contamination may not imply that there would be a significant impact during linear facility construction, since it could be cleaned up either before or during construction. Natural gas would be supplied to the project via an existing gas supply pipeline. Excavation would be required for two 9,400 feet underground transmission cables to connect Unit 7 to PG&E's Hunters Point Substation, the cooling water intake for Potrero Unit 3, which would be replaced and combined with a new intake for Unit 7, and two new cooling water discharge systems, with diffusers, to serve both the new unit 7 and existing unit 3. Contaminated sediments are present along the proposed alignments for the cooling water intake and discharge pipes, but until the results of ongoing investigations are available, the extent of the contamination is unclear. However, sediments removed would have to be disposed of appropriately.

IMPACTS OF ALTERNATIVE SITES

ALT-A

Site ALT-A is located at Cargo Way in San Francisco and was approved for a power plant site in 1995 by the Energy Commission.

Phase I and II Environmental Site Assessments conducted for the property found that chemicals of concern were generally present in fill material over the entire site. Chemicals were found at apparently random locations within the fill material, showing no clear concentration trends with depth. Soil sample locations in relationship to groundwater depth also did not seem to influence the distribution of chemicals at the site. High concentrations of metals and organic chemicals were found in samples collected both above and below the water table. Investigators speculated that deposition of wastes during previous landfilling activities was probably a major contributor to the distribution pattern of metals and other chemicals identified in the soils. Staff ultimately concluded that management of the wastes generated during project construction at that site would not result in any significant adverse impacts if appropriate mitigation measures were implemented.

ALT-B

Site ALT-B, a parking lot located north of Gilman Avenue across from 3Com Park, is vacant land adjacent to undeveloped park property. The potential for contamination at this site is not known in the absence of an Environmental Site Assessment.

ALT-C

Site ALT-C is immediately northwest of the intersection of Bayshore Boulevard and Geneva Avenue. The site is located entirely north of Geneva and has undergone remediation for heavy metals contamination. The area south of Geneva remains contaminated with hydrocarbons. Staff is unaware if all contamination issues have been resolved north of Geneva, or if additional issues remain.

ALT-D

Site ALT-D is southeast of the intersection of Haskins Way and East Jamie Court, adjacent to the City of South San Francisco recycling facility. Staff currently does not have information regarding the potential for contamination at this site.

ALT-E

ALT-E is south of North Access Road adjacent to the United Golden Gate peaking power plant recently approved by the Commission. A Phase I Environmental Site Assessment was conducted for the peaking power plant site. Prior to its use as a parking lot, the site was occupied by mudflats adjacent to San Francisco Bay which were reclaimed by the addition of fill material. No areas of environmental concern were identified, and no additional investigation was recommended.

OPERATION

The amounts and types of most wastes generated during routine facility operation, such as used oil, solvents, batteries, air pollution control catalyst, and the like, are a function of facility design, and not location. Wastes generated from treating water used in plant operations could vary slightly, depending on the quality of the source water. Types and amounts of normally occurring constituents can vary greatly in ground and surface water supplies, and the use of reclaimed water may require special treatment options. In addition, site specific considerations may lead to differences in wastewater disposal options, such as zero discharge or the use of evaporation ponds, which in turn may influence the quantity and types of wastes generated from water treatment and use. However, site specific differences in water supply and quality may not lead to significant differences in waste management impacts, since these are usually either minor, or can be mitigated successfully.

CONCLUSION

Staff is awaiting results of sediment contamination studies before determining the potential for adverse environmental impacts from managing such wastes at the proposed site. Wastes generated from construction and operation of the facility itself will not vary with project location. Some differences in the quantity and types of project operational wastes at alternative sites could result, but such differences would be very minor. For sites lacking an Environmental Site Assessment, the

amounts of hazardous or nonhazardous waste which may be generated during site preparation is speculative.

Site ALT-A is known to have existing contamination. The potential for contamination at Alts-B, C, and D is not known, while ALT-E is unlikely to contain any significant contamination, based on the site assessment performed there. In most cases, however, management of hazardous wastes from site cleanup activities can be accomplished without significant adverse environmental impacts.

ALTERNATIVES APPENDIX B: ALTERNATIVES ELIMINATED FROM DETAILED ANALYSIS

Alternatives that did not satisfy the screening criteria include technology alternatives, renewable resources, alternative generating capacities, transmission alternatives, and several alternative sites.

TRANSMISSION ALTERNATIVES

The AFC (SECAL 2000a, AFC pages 9-10 to 9-12) addresses potential transmission alternatives that could improve the supply and reliability of electricity in San Francisco. Mirant references the CAISO's San Francisco Long-Term Study, and states "... none of these alternative projects are actively being developed by PG&E or the ISO." Mirant argues that the Unit 7 project is "the most practical and efficient alternative" in comparison to the transmission alternatives. In fact, as discussed under the No Project Alternative (above), PG&E is preparing documentation for an application to the CPUC for the Jefferson-Martin 230 kV Project, described in the Long-Term Study.

However, as discussed in the No Project Alternative discussion above, the CAISO and PG&E believe that both generation improvements and transmission improvements are required to enhance reliability in San Francisco. Therefore, transmission is not an alternative to generation: both are required.

ALTERNATIVE SITES

APPLICANT'S ALTERNATIVE SITE

Mirant's AFC considered two alternative sites: Cargo Way and the Western Pacific site. The Cargo Way site is evaluated as ALT-A. The Western Pacific site was eliminated as described below.

WESTERN PACIFIC SITE

This site has approximately 30 acres and is located south of 25th Street and east of Illinois Street. The site is zoned for heavy industry, but it is offered by the Port of San Francisco as part of a Mixed Use Opportunity Area. Currently, much of the site is under construction for use as a SF Municipal Railroad (Muni) maintenance yard. This site has been eliminated from consideration because (1) the Muni development will occupy much of the land and (2) the site is so close to the proposed Potrero site (less than 1,000 feet south) that it would not eliminate or reduce any of the impacts of that site.

SITES CONSIDERED IN SFEC STAFF ASSESSMENT

SF THERMAL

This site is located between 5th and 6th Streets, between Market and Mission, adjacent to the City's steam generating plant. The site is currently used as a

parking lot. The location of this site was determined to be inappropriate for a power plant since it is near heavily used commercial areas (Market Street shopping to the north) and public areas (Metreon, etc. to the south) and surrounded by scattered residential pockets.

CITY ASPHALT PLANT

This facility, which is currently operating, is located at the corner of Quint and Jerrold, near the Southeast Water Treatment Plant. The site is small and triangular shaped (adjacent to the railroad), and could support only a smaller power plant. The site was eliminated because, with residential neighborhoods only two to three blocks away, it would not eliminate any impacts of the proposed project.

SITES IDENTIFIED BY STAFF

CARROLL AVENUE: NORTH OF 3COM PARK

This site is currently used as a parking lot for events at 3Com Park, and is located at the east end of Carroll Avenue adjacent to State Park lands. The vacant lot may become less used as events at 3Com Park are discontinued. However, this site was eliminated because there are residential properties located less than one block away, to the south.

SOUTH SAN FRANCISCO: BELLE AIR ROAD

This site is within an industrial area of the City of South San Francisco, east of the 101 Freeway and north of North Access Road. The land is used primarily for the City's water treatment facilities, and only a small area would be available for use as a power plant. Therefore the site was eliminated for feasibility concerns.

3COM PARK

Since the park itself is likely to become obsolete in the future, its location was considered for a power plant site. However, because the timing of the potential discontinued use is not certain, there are residences to the north and west, and parkland surrounds the site, the site was eliminated from consideration.

ALTERNATIVE TECHNOLOGIES ELIMINATED FROM DETAILED CONSIDERATION

This section presents the rationale for not evaluating in detail the following types of alternatives:

- Technology Alternatives (including demand side management and distributed generation)
- Renewable resources
- Alternative Generation Capacities

TECHNOLOGY ALTERNATIVES

DEMAND SIDE MANAGEMENT

One alternative to a power generation project could be programs to reduce energy consumption. These programs are typically called "energy efficiency," "conservation," or "demand side management" programs. One goal of these programs is to reduce overall electricity use; some programs also attempt to shift such energy use to off-peak periods.

The Energy Commission is responsible for several such programs, the most notable of which are energy efficiency standards for new buildings and for major appliances. The California Public Utilities Commission supervises various demand side management programs administered by the regulated monopolies, and many municipal electric utilities have their own demand side management programs. The combination of these programs constitutes the most ambitious overall approach to reducing electricity demand administered by any state in the nation.

Staff has already accounted for the effects all of the demand side management that is reasonably expected to occur in evaluating the future electricity needs of the Bay Area and how much additional generation will be necessary. Therefore, demand side management is not an alternative to the proposed project. Furthermore, the Warren-Alquist Act prohibits the Energy Commission, in its alternatives analysis, from considering such conservation programs to be alternatives to a proposed generation project. (Pub. Resources Code, Section 25305(c).)

DISTRIBUTED GENERATION

Distributed generation is modular electric generation or storage located close to the point of use. According to a recent study (Alderfer 2000),

“Environmentally-friendly renewable energy technologies such as wind turbines and photovoltaics and clean, efficient, fossil-fuel technologies such as gas turbines and fuel cells are among the fleet of new generating technologies driving the demand for distributed generation of electricity.”

However, feasibility and environmental impacts are problems for these technologies. A number of serious barriers, including technical issues, business practices, and regulatory policies, make interconnection to the electrical grid in the United States difficult (Alderfer 2000).

Additional problems of specific types of distributed generation include the following.

RENEWABLE ENERGY SOURCES

The high cost and limited dispatchability of renewable energy sources such as solar, wind, and biomass essentially inhibit their market penetration (Iannucci 2000).

FUEL CELLS

The present high cost of fuel cells precludes their widespread use.

OTHER FOSSIL-FUELED SYSTEMS

Microturbines and various types of engines can also be used for distributed generation. However, these fossil-fueled technologies have the potential for significant environmental impacts. Potential site-specific impacts include noise. Such systems also have the potential for significant cumulative air quality impacts because individually they are typically small enough to avoid the regulatory requirements for air pollution control. Therefore, use of enough of these systems to constitute an alternative to the proposed project would potentially cause significant unmitigated air quality impacts.

SUMMARY: DISTRIBUTED GENERATION

Distributed energy is not a feasible alternative to the proposed project because of technical, institutional, and regulatory barriers. Some types of distributed generation also are not feasible alternatives because they are not presently economical, and others are also not feasible because they have the potential to cause significant unmitigated environmental impacts.

RENEWABLE RESOURCES

Staff examined the principal renewable electricity generation technologies that could serve as alternatives to the proposed project and do not burn fossil fuels. These technologies are geothermal, solar, hydroelectric, wind, and biomass. Each of these technologies could be attractive from an environmental perspective because of the absence or reduced level of air pollutant emissions. However, these technologies also cause environmental consequences and have feasibility problems.

Solar, wind, and hydroelectric resources require large land areas in order to generate 600 megawatts of electricity. Specifically, centralized solar projects using the parabolic trough technology require approximately 5 acres per megawatt. This 600 MW plant would require approximately 3,000 acres. Photovoltaic arrays require similar acreage per megawatt. Centralized wind generation areas generally require 40-50 acres per megawatt, with 600 megawatts requiring 24,000 - 30,000 acres. Large hydroelectric facilities generating 600 megawatts would inundate at least 30,000 acres with water. These technologies have the potential to cause significant land use, biological, cultural resource, and visual impacts. In summary, staff does not believe that these alternatives would be environmentally preferable to the proposed project.

Staff also considered the alternative of a biomass facility. However, biomass facilities are generally in the 3 to 10 MW range, must overcome significant fuel source reliability issues, have difficulty being economically competitive, and are typically worse from an air quality perspective than natural gas. For these reasons such a project would not be a feasible alternative, nor would it be likely to sufficiently satisfy project goals.

Severe resource constraints also exist for most of the renewable technologies. Geothermal resources sufficient to generate substantial amounts of electricity are

not available. Opportunities for new hydroelectric, wind, or biomass generation are very limited.

ALTERNATIVE GENERATION CAPACITIES

A power plant with a smaller generating capacity could reduce some of the environmental impacts of the proposed project. A smaller power plant would not require as large an area as the proposed project. However, given that the proposed project would be located entirely within the site already owned by the applicant, this issue cannot be seen as significant.

A smaller capacity power plant would have lower water needs (both intake and discharge), so the potential for marine biological impacts would be reduced. A smaller power plant would also be likely to have lower noise levels than the proposed project, although noise mitigation would likely still be required. A smaller power plant would have less visual impact than the proposed project. Analysis of a specific design would be required to precisely determine the visual impacts of a smaller power plant. In summary, a power plant with a smaller capacity may eliminate some of the potentially significant impacts of the proposed project.

Two potential sites for smaller facilities were considered but eliminated; see "Sites Considered in SFEC Staff Assessment," below.

Overall, a power plant with a smaller output capacity could reduce some environmental impacts of the proposed project. However, such a plant would not meet the reliability objective of the project, which requires generation of at least 500 MW of electricity.

GENERAL CONDITIONS INCLUDING COMPLIANCE MONITORING AND CLOSURE PLAN

Donna Stone

INTRODUCTION

The project General Conditions Including Compliance Monitoring and Closure Plan (Compliance Plan) have been established as required by Public Resources Code section 25532. The plan provides a means for assuring that the facility is constructed, operated and closed in conjunction with air and water quality, public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission (Energy Commission) and specified in the written decision on the Application for Certification or otherwise required by law.

The Compliance Plan is composed of the following elements:

1. General conditions that:
 - a) set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
 - b) set forth the requirements for handling confidential records and maintaining the compliance record;
 - c) state procedures for settling disputes and making post-certification changes;
 - d) state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all Energy Commission approved conditions; and
 - e) establish requirements for facility closure plans.
2. Specific conditions of certification:

Specific conditions of certification that follow each technical area contain the measures required to mitigate any and all potential adverse project impacts associated with construction, operation and closure to an insignificant level. Each specific condition of certification also includes a verification provision that describes the method of verifying that the condition has been satisfied.

GENERAL CONDITIONS OF CERTIFICATION

DEFINITIONS

To ensure consistency, continuity and efficiency, the following terms, as defined, apply to all technical areas, including Conditions of Certification:

SITE MOBILIZATION:

Moving trailers and related equipment onto the site, usually accompanied by minor ground disturbance, grading for the trailers and limited vehicle parking, trenching for utilities, installing utilities, grading for an access corridor, and other related activities. Ground disturbance, grading, etc. for site mobilization are limited to the portion of the site necessary for placing the trailers and providing access and parking for the occupants. Site mobilization is for temporary facilities and is therefore not considered construction.

GROUND DISTURBANCE:

Onsite activity that results in the removal of soil or vegetation, boring, trenching or alteration of the site surface. This does not include driving or parking a passenger vehicle, pickup truck, or other light vehicle, or walking on the site.

GRADING:

Onsite activity conducted with earth-moving equipment that results in alteration of the topographical features of the site such as leveling, removal of hills or high spots, or moving of soil from one area to another.

CONSTRUCTION:

[From section 25105 of the Warren-Alquist Act.] Onsite work to install permanent equipment or structures for any facility. Construction does **not** include the following:

- a. The installation of environmental monitoring equipment.
- b. A soil or geological investigation.
- c. A topographical survey.
- d. Any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility.
- e. Any work to provide access to the site for any of the purposes specified in a., b., c., or d.

START OF COMMERCIAL OPERATION

- a. The project startup team has completed work.
- b. The plant manager accepts control from the construction manager.
- c. Expenses for the project are switched from construction to operation.
- d. The facility has reached steady state with reliability at the rated capacity.
- e. Financing accounting switches from construction (capital costs) to operations (Income-producing expenses) financing.

COMPLIANCE PROJECT MANAGER (CPM) RESPONSIBILITIES

A CPM will oversee the compliance monitoring and shall be responsible for:

1. ensuring that the design, construction, operation, and closure of the project facilities is in compliance with the terms and conditions of the Commission Decision;
2. resolving complaints;
3. processing post-certification changes to the conditions of certification, project description, and ownership or operational control;
4. documenting and tracking compliance filings; and,
5. ensuring that the compliance files are maintained and accessible.

The CPM is the contact person for the Energy Commission and will consult with appropriate responsible agencies and the Energy Commission when handling disputes, complaints and amendments.

All project compliance submittals are submitted to the CPM for processing. Where a submittal required by a condition of certification requires CPM approval, it should be understood that the approval would involve all appropriate staff and management.

The Commission has established a toll free compliance telephone number of **1-800-858-0784** for the public to contact the Commission about power plant construction or operation-related questions, complaints or concerns.

PRE-CONSTRUCTION AND PRE-OPERATION COMPLIANCE MEETING

The CPM may schedule pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings will be to assemble both the Energy Commission's and the project owner's technical staff to review the status of all pre-construction or pre-operation requirements and milestones contained in the Energy Commission's conditions of certification to confirm that they have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings shall ensure, to the extent possible, that Energy Commission conditions will not delay the construction and operation of the plant due to oversight or inadvertence and to preclude any last minute, unforeseen issues from arising. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes.

ENERGY COMMISSION RECORD

The Energy Commission shall maintain as a public record, in either the Compliance file or Docket file, for the life of the project (or other period as required):

1. all documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;
2. all monthly and annual compliance reports filed by the project owner;
3. all complaints of noncompliance filed with the Energy Commission; and,
4. all petitions for project or condition changes and the resulting staff or Energy Commission action taken.

PROJECT OWNER RESPONSIBILITIES

It is the responsibility of the project owner to ensure that the general compliance conditions and the conditions of certification are satisfied. The general compliance conditions regarding post-certification changes specify measures that the project owner must take when requesting changes in the project design, compliance conditions, or ownership. Failure to comply with any of the conditions of certification or the general compliance conditions may result in reopening of the case and revocation of Energy Commission certification, an administrative fine, or other action as appropriate.

ACCESS

The CPM, responsible Energy Commission staff, and delegate agencies or consultants, shall be guaranteed and granted unrestricted access to the power plant site, related facilities, project-related staff, and the records maintained on site, for the purpose of conducting audits, surveys, inspections, or general site visits. Although the CPM will normally schedule site visits on dates and times agreeable to the project owner, the CPM reserves the right to make unannounced visits at any time.

COMPLIANCE RECORD

The project owner shall maintain project files on-site or at an alternative site approved by the CPM, for the life of the project. The files shall contain copies of all “as-built” drawings, all documents submitted as verification for conditions, and all other project-related documents for the life of the project, unless a lesser period is specified by the conditions of certification.

Energy Commission staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files.

COMPLIANCE VERIFICATIONS

Each condition of certification is followed by a means of verification. The verification describes the Energy Commission’s procedure(s) to ensure post-certification compliance with adopted conditions. The verification procedures, unlike the conditions, may be modified, as necessary by the CPM, and in most cases without full Energy Commission approval.

Verification of compliance with the conditions of certification can be accomplished by:

reporting on the work done and providing the pertinent documentation in monthly and/or annual compliance reports filed by the project owner or authorized agent as required by the specific conditions of certification;
appropriate letters from delegate agencies verifying compliance;
Energy Commission staff audits of project records; and/or
Energy Commission staff inspections of mitigation and/or other evidence of mitigation.

Verification lead times (e.g., 90, 60 and 30-days) associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. **The cover letter subject line shall identify the involved condition(s) of certification by condition number and include a brief description of the subject of the submittal.** The project owner shall also identify those submittals **not** required by a condition of certification with a statement such as: "This submittal is for information only and is not required by a specific condition of certification." When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal.

The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether such condition was satisfied by work performed by the project owner or an agent of the project owner.

All submittals shall be addressed as follows:

**Compliance Project Manager
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814**

If the project owner desires Energy Commission staff action by a specific date, they shall so state in their submittal and include a detailed explanation of the effects on the project if this date is not met.

COMPLIANCE REPORTING

There are two different compliance reports that the project owner must submit to assist the CPM in tracking activities and monitoring compliance with the terms and conditions of the Commission Decision. During construction, the project owner or authorized agent will submit Monthly Compliance Reports. During operation, an Annual Compliance Report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the

conditions of certification require that compliance submittals be submitted to the CPM in the monthly or annual compliance reports.

COMPLIANCE MATRIX

A compliance matrix shall be submitted by the project owner to the CPM along with each monthly and annual compliance report. The compliance matrix is intended to provide the CPM with the current status of all compliance conditions in a spreadsheet format. The compliance matrix must identify:

1. the technical area,
2. the condition number,
3. a brief description of the verification action or submittal required by the condition,
4. the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.),
5. the expected or actual submittal date,
6. the date a submittal or action was approved by the Chief Building Official (CBO), CPM, or delegate agency, if applicable,
7. the compliance status for each condition (e.g., “not started”, “in progress” or “completed date”), and
8. the project’s preconstruction and construction milestones, including dates and status.

Completed or satisfied conditions do not need to be included in the compliance matrix after they have been identified as completed/satisfied in at least one monthly or annual compliance report.

PRE-CONSTRUCTION MATRIX

Prior to commencing construction a compliance matrix addressing only those conditions that must be fulfilled before the start of construction shall be submitted by the project owner to the CPM. This matrix will be included with the project owner’s **first** compliance submittal. It will be in the same format as the compliance matrix referenced above.

TASKS PRIOR TO START OF CONSTRUCTION

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing construction. Project owners frequently anticipate starting project construction as soon as the project is certified. In some cases it may be necessary for the project owner to file submittals prior to certification if the required lead-time for a required compliance event extends beyond the date anticipated for start of construction. It is also important that the project owner understand that pre-construction activities that are initiated prior to certification are performed at the owner’s own risk. Failure to allow specified lead-time may cause delays in start of construction.

Various lead times for verification submittals to the CPM for conditions of certification are established to allow sufficient staff time to review and comment, and if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

MONTHLY COMPLIANCE REPORT

The first Monthly Compliance Report is due the month following the Energy Commission business meeting date on which the project was approved, unless otherwise agreed to by the CPM. The first Monthly Compliance Report shall include an initial list of dates for each of the events identified on the Key Events List. The Key Events List is found at the end of this section.

During pre-construction and construction of the project, the project owner or authorized agent shall submit an original and five copies of the Monthly Compliance Report within 10 working days after the end of each reporting month. Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain at a minimum:

1. a summary of the current project construction and milestones status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;
2. documents required by specific conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Monthly Compliance Report;
3. an initial, and thereafter updated, compliance matrix which shows the status of all conditions of certification and preconstruction and construction milestones (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
4. a list of conditions and milestones that have been satisfied during the reporting period, and a description or reference to the actions which satisfied the condition;
5. a list of any submittal deadlines that were missed accompanied by an explanation and an estimate of when the information will be provided;
6. a cumulative listing of any approved changes to conditions of certification;
7. a listing of any filings with, or permits issued by, other governmental agencies during the month;
8. a projection of project compliance activities scheduled during the next two months. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with conditions of certification or milestones;
9. a listing of the month's additions to the on-site compliance file; and
10. any requests to dispose of items that are required to be maintained in the project owner's compliance file.
11. a listing of complaints, notices of violation, official warnings, and citations received during the month; a description of the resolution of any complaints which have been resolved, and the status of any unresolved complaints.

ANNUAL COMPLIANCE REPORT

After the air district has issued a Permit to Operate, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports. The reports are for each year of commercial operation and are due to the CPM each year at a date agreed to by the CPM. Annual Compliance Reports shall be submitted over the life of the project unless otherwise specified by the CPM. Each Annual Compliance Report shall identify the reporting period and shall contain the following:

1. an updated compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
2. a summary of the current project operating status and an explanation of any significant changes to facility operations during the year;
3. documents required by specific conditions to be submitted along with the Annual Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Annual Compliance Report;
4. a cumulative listing of all post-certification changes approved by the Energy Commission or cleared by the CPM;
5. an explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;
6. a listing of filings made to, or permits issued by, other governmental agencies during the year;
7. a projection of project compliance activities scheduled during the next year;
8. a listing of the year's additions to the on-site compliance file, and
9. an evaluation of the on-site contingency plan for unexpected facility closure, including any suggestions necessary for bringing the plan up to date [see General Conditions for Facility Closure addressed later in this section].
10. a listing of complaints, notices of violation, official warnings, and citations received during the year; a description of the resolution of any complaints which have been resolved, and the status of any unresolved complaints.

CONFIDENTIAL INFORMATION

Any information, which the project owner deems confidential shall be submitted to the Energy Commission's Docket with an application for confidentiality pursuant to Title 20, California Code of Regulations, section 2505(a). Any information, which is determined to be confidential, shall be kept confidential as provided for in Title 20, California Code of Regulations, section 2501 et. seq.

DEPARTMENT OF FISH AND GAME FILING FEE

Pursuant to the provisions of Fish and Game Code Section 711.4, the project owner shall pay a filing fee in the amount of eight hundred and fifty dollars (\$850). The payment instrument shall be provided to the Commission's Project Manager at the time of project certification and shall be made payable to the California Department of Fish and Game. The Commission's Project Manager will submit the payment to the Office of Planning and Research at the time of filing of the notice of decision pursuant to Public Resources Code Section 21080.5.

REPORTING OF COMPLAINTS, NOTICES, AND CITATIONS

Prior to the start of construction, the project owner must send a letter to property owners living within one mile of the project notifying them of a telephone number to contact project representatives with questions, complaints or concerns. If the telephone is not staffed 24 hours per day, it shall include automatic answering, with date and time stamp recording. All recorded inquiries shall be responded to within 24 hours. The telephone number shall be posted at the project site and made easily visible to passersby during construction and operation. The telephone number shall be provided to the CPM who will post it on the Energy Commission's web page at www.energy.ca.gov/sitingcases. Any changes to the telephone number shall be submitted immediately to the CPM who will update the web page.

In addition to the monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies of all complaint forms, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt, to the CPM. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the **NOISE** conditions of certification. All other complaints shall be recorded on the complaint form on the following page.

COMPLAINT REPORT/RESOLUTION FORM

PROJECT NAME:

AFC Number:

COMPLAINT LOG NUMBER _____

Complainant's name and address:

Phone number:

Date and time complaint received:

Indicate if by telephone or in writing (attach copy if written):

Date of first occurrence:

Description of complaint (including dates, frequency, and duration):

Findings of investigation by plant personnel:

Indicate if complaint relates to violation of a CEC requirement:

Date complainant contacted to discuss findings:

Description of corrective measures taken or other complaint resolution:

Indicate if complainant agrees with proposed resolution:

If not, explain:

Other relevant information:

If corrective action necessary, date completed:

Date first letter sent to complainant: _____(copy attached)

Date final letter sent to complainant: _____(copy attached)

This information is certified to be correct.

Plant Manager's Signature: _____ Date: _____

(Attach additional pages and supporting documentation, as required.)

CONSTRUCTION MILESTONES

The following is the procedure for establishing and enforcing milestones, which include milestone dates for pre-construction and construction phases of the project.

Milestones, and method of verification must be established and agreed upon by the project owner and the CPM no later than 30 days after project approval, the date of docketing. If this deadline is not met, the CPM will establish the milestones.

I. ESTABLISH PRE-CONSTRUCTION MILESTONES TO ENABLE START OF CONSTRUCTION WITHIN ONE YEAR OF CERTIFICATION

1. Obtain site control.
2. Obtain financing.
3. Mobilize site.
4. Begin rough grading for permanent structures (start of construction).

II. ESTABLISH CONSTRUCTION MILESTONES FROM DATE OF START OF CONSTRUCTION

1. Begin pouring major foundation concrete.
2. Begin installation of major equipment.
3. Complete installation of major equipment.
4. Begin gas pipeline construction.
5. Complete gas pipeline interconnection.
6. Begin T-line construction.
7. Complete T-line interconnection.
8. Begin commercial operation.

The CPM will negotiate the above-cited pre-construction and construction milestones with the project owner based on an expected schedule of construction. The CPM may agree to modify the final milestones from those listed above at any time prior to or during construction if the project owner demonstrates good-cause for not meeting the originally-established milestones. Otherwise, failure to meet milestone dates without a finding of good cause is considered cause for possible forfeiture of certification or other penalties.

III. A finding that there is good cause for failure to meet milestones will be made if any of the following criteria are met:

1. The change in any milestone does not change the established commercial operation date milestone.
2. The milestone is changed due to circumstances beyond the project owner's control.
3. The milestone will be missed, but the project owner demonstrates a good-faith effort to meet the project milestone.
4. The milestone is missed due to unforeseen natural disasters or acts of God which prevent timely completion of the milestones.

If a milestone date cannot be met, the CPM will make a determination whether the project owner has demonstrated good cause for failure to meet the milestone. If the determination is that good cause exists, the CPM will negotiate revised milestones.

If the project owner fails to meet one or more of the established milestones, and the CPM determines that good cause does not exist, the CPM will make a recommendation to the Executive Director. Upon receiving such recommendation, the Executive Director will take one of the following actions.

1. Conclude that good cause exists and direct that revised milestones be established; or
2. Issue a reprimand, impose a fine, or take other appropriate remedial action and direct that revised milestones be established; or
3. Recommend, after consulting with the Energy Facility Siting and Environmental Committee, that the Commission issue a finding that the project owner has forfeited the project's certification.

The project owner has the right to appeal a finding of no good cause, or any recommended remedial action, to the Energy Facility Siting and Environmental Committee, and to the full Commission.

FACILITY CLOSURE

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made which provide the flexibility to deal with the specific situation and project setting which that exist at the time of closure. LORS pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will be consistent with LORS in effect at the time of closure.

There are at least three circumstances in which a facility closure can take place, planned closure, unexpected temporary closure and unexpected permanent closure.

PLANNED CLOSURE

A planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence.

UNEXPECTED TEMPORARY CLOSURE

An unplanned unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster, or an emergency.

UNEXPECTED PERMANENT CLOSURE

An unplanned unexpected permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned.

GENERAL CONDITIONS FOR FACILITY CLOSURE

PLANNED CLOSURE

In order to ensure that a planned facility closure does not create adverse impacts, a closure process that provides for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least twelve months prior to commencement of closure activities (or other period of time agreed to by the CPM). The project owner shall file 120 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission. The plan shall:

1. identify and discuss any impacts and mitigation to address significant adverse impacts associated with proposed closure activities and to address facilities, equipment, or other project related remnants that will remain at the site.
2. identify a schedule of activities for closure of the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project;
3. identify any facilities or equipment intended to remain on site after closure, the reason, and any future use; and
4. address conformance of the plan with all applicable laws, ordinances, regulations, standards, local/regional plans in existence at the time of facility closure, and applicable conditions of certification.

Also, in the event that there are significant issues associated with the proposed facility closure plan's approval, or the desires of local officials or interested parties are inconsistent with the plan, the CPM shall hold one or more workshops and/or the Commission may hold public hearings as part of its approval procedure.

In addition, prior to submittal of the proposed facility closure plan, a meeting shall be held between the project owner and the Commission CPM for the purpose of discussing the specific contents of the plan.

As necessary, prior to, or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety and the environment, but shall not commence any other closure activities, until Commission approval of the facility closure plan is obtained.

UNEXPECTED TEMPORARY CLOSURE

In order to ensure that public health and safety and the environment are protected in the event of an unexpected temporary facility closure, it is essential to have an on-site contingency plan in place. The on-site contingency plan will help to ensure that all necessary steps to mitigate public health and safety, and environmental impacts, are taken in a timely manner.

The project owner shall submit an on-site contingency plan for CPM review and approval. The plan shall be submitted no less than 60 days (or other time agreed to by the CPM) prior to commencement of commercial operation. The approved plan must be in place prior to commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with the CPM, will update the on-site contingency plan as necessary. The CPM may require revisions to the on-site contingency plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the on-site contingency plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by the CPM.

The on-site contingency plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, for closures of more than 90 days (unless other arrangements are agreed to by the CPM), the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment and the safe shutdown of all equipment (also see specific conditions of certification for the technical areas of Hazardous Materials Management and Waste Management).

In addition, consistent with requirements under unexpected permanent closure addressed below, the nature and extent of insurance coverage, and major equipment warranties must also be included in the on-site contingency plan. In addition, the status of the insurance coverage and major equipment warranties must be updated in the annual compliance reports.

In the event of an unexpected temporary closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, e-mail, etc., within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the circumstances and expected duration of the closure.

If the CPM determines that a temporary closure is likely to be permanent, or for a duration of more than twelve months, a closure plan consistent with that for a

planned closure shall be developed and submitted to the CPM within 90 days of the CPM's determination (or other period of time agreed to by the CPM).

UNEXPECTED PERMANENT CLOSURE

The on-site contingency plan required for unexpected temporary closure shall also cover unexpected permanent facility closure. All of the requirements specified for unexpected temporary closure shall also apply to unexpected permanent closure.

In addition, the on-site contingency plan shall address how the project owner will ensure that all required closure steps will be successfully undertaken in the unlikely event of abandonment.

In the event of an unexpected permanent closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, e-mail, etc., within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the status of all closure activities.

A closure plan consistent with that for a planned closure shall be developed and submitted to the CPM within 90 days of the permanent closure (or other period of time agreed to by the CPM).

DELEGATE AGENCIES

To the extent permitted by law, the Energy Commission may delegate authority for compliance verification and enforcement to various state and local agencies that have expertise in subject areas where specific requirements have been established as a condition of certification. If a delegate agency does not participate in this program, the Energy Commission staff will establish an alternative method of verification and enforcement. Energy Commission staff reserves the right to independently verify compliance.

In performing construction and operation monitoring of the project, the Energy Commission staff acts as, and has the authority of, the Chief Building Official (CBO). The Commission staff retains this authority when delegating to a local CBO. Delegation of authority for compliance verification includes the authority for enforcing codes, the responsibility for code interpretation where required, and the authority to use discretion, as necessary, in implementing the various codes and standards.

Whenever an agency's responsibility for a particular area is transferred by law to another entity, all references to the original agency shall be interpreted to apply to the successor entity.

ENFORCEMENT

The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code sections 25534 and 25900. The

Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Commission Decision. The specific action and amount of any fines the Commission may impose would take into account the specific circumstances of the incident(s). This would include such factors as the previous compliance history, whether the cause of the incident involves willful disregard of LORS, inadvertence, unforeseeable events, and other factors the Commission may consider.

Moreover, to ensure compliance with the terms and conditions of certification and applicable laws, ordinances, regulations, and standards, delegate agencies are authorized to take any action allowed by law in accordance with their statutory authority, regulations, and administrative procedures.

NONCOMPLIANCE COMPLAINT PROCEDURES

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1230 et. seq., but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure, as described in current State law and regulations, are described below. They shall be followed unless superseded by current law or regulations.

INFORMAL DISPUTE RESOLUTION PROCEDURE

The following procedure is designed to informally resolve disputes concerning interpretation of compliance with the requirements of this compliance plan. The project owner, the Energy Commission, or any other party, including members of the public, may initiate this procedure for resolving a dispute. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents.

This procedure may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1230 et. seq., but is not intended to be a substitute for, or prerequisite to it. This informal procedure may not be used to change the terms and conditions of certification as approved by the Energy Commission, although the agreed upon resolution may result in a project owner, or in some cases the Energy Commission staff, proposing an amendment.

The procedure encourages all parties involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a dispute cannot be resolved, then the matter must be referred to the full Energy Commission for consideration via the complaint and investigation process. The procedure for informal dispute resolution is as follows:

REQUEST FOR INFORMAL INVESTIGATION

Any individual, group, or agency may request the Energy Commission to conduct an informal investigation of alleged noncompliance with the Energy Commission's

terms and conditions of certification. All requests for informal investigations shall be made to the designated CPM.

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner and to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM finds that further investigation is necessary, the project owner will be asked to promptly investigate the matter and within seven (7) working days of the CPM's request, provide a written report of the results of the investigation, including corrective measures proposed or undertaken, to the CPM. Depending on the urgency of the noncompliance matter, the CPM may conduct a site visit and/or request the project owner to provide an initial report, within forty-eight (48) hours, followed by a written report filed within seven (7) days.

REQUEST FOR INFORMAL MEETING

In the event that either the party requesting an investigation or the Energy Commission staff is not satisfied with the project owner's report, investigation of the event, or corrective measures undertaken, either party may submit a written request to the CPM for a meeting with the project owner. Such request shall be made within fourteen (14) days of the project owner's filing of its written report. Upon receipt of such a request, the CPM shall:

1. immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;
2. secure the attendance of appropriate Energy Commission staff and staff of any other agency with expertise in the subject area of concern as necessary;
3. conduct such meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner; and,
4. after the conclusion of such a meeting, promptly prepare and distribute copies to all in attendance and to the project file, a summary memorandum which fairly and accurately identifies the positions of all parties and any conclusions reached. If an agreement has not been reached, the CPM shall inform the complainant of the formal complaint process and requirements provided under Title 20, California Code of Regulations, section 1230 et. seq.

FORMAL DISPUTE RESOLUTION PROCEDURE-COMPLAINTS AND INVESTIGATIONS

If either the project owner, Energy Commission staff, or the party requesting an investigation is not satisfied with the results of the informal dispute resolution process, such party may file a complaint or a request for an investigation with the Energy Commission's General Counsel. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents.

Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1230 et. seq.

The Chairman, upon receipt of a written request stating the basis of the dispute, may grant a hearing on the matter, consistent with the requirements of noticing provisions. The Commission shall have the authority to consider all relevant facts involved and make any appropriate orders consistent with its jurisdiction (Title 20, California Code of Regulations, sections 1232 - 1236).

POST CERTIFICATION CHANGES TO THE COMMISSION DECISION: AMENDMENTS, INSIGNIFICANT PROJECT CHANGES AND VERIFICATION CHANGES

The project owner must petition the Energy Commission, pursuant to Title 20, California Code of Regulations, section 1769, to 1) delete or change a condition of certification; 2) modify the project design or operational requirements; and 3) transfer ownership or operational control of the facility.

A petition is required for **amendments** and for **insignificant project changes**. For verification changes, a letter from the project owner is sufficient. In all cases, the petition or letter requesting a change should be submitted to the Commission's Docket in accordance with Title 20, California Code of Regulations, section 1209. The criteria that determine which type of change process applies are explained below.

AMENDMENT

A proposed change will be processed as an amendment if it involves a change to the requirement or protocol (and in some cases the verification) portion of a condition of certification, an ownership or operator change, or a potential significant environmental impact.

INSIGNIFICANT PROJECT CHANGE

The proposed change will be processed as an insignificant project change if it does not require changing the language in a condition of certification, have a potential for significant environmental impact, and cause the project to violate laws, ordinances, regulations or standards.

VERIFICATION CHANGE

The proposed change will be processed as a verification change if it involves only the language in the verification portion of the condition of certification. This procedure can only be used to change verification requirements that are of an administrative nature, usually the timing of a required action. In the unlikely event that verification language contains technical requirements, the proposed change must be processed as an amendment.

KEY EVENT LIST

PROJECT: _____

DOCKET #: _____

COMPLIANCE PROJECT MANAGER: _____

EVENT DESCRIPTION	DATE
Certification Date	
Online Date	
POWER PLANT SITE ACTIVITIES	
Start Site Mobilization	
Start Ground Disturbance	
Start Rough Grading	
Start Construction	
First Combustion of Gas Turbine	
Start Commercial Operation	
Complete All Construction	
TRANSMISSION LINE ACTIVITIES	
Start T/L Construction	
Synchronization with Grid	
Complete T/L Construction	
FUEL SUPPLY LINE ACTIVITIES	
Start Fuel Supply Line Construction	
Complete Fuel Supply Line Construction	
WATER SUPPLY LINE ACTIVITIES	
Start Water Supply Line Construction	
Complete Water Supply Line Construction	

POTRERO POWER PROJECT PREPARATION TEAM

Executive Summary.....	Marc Pryor
Introduction.....	Marc Pryor
Project Description.....	Marc Pryor
Air Quality	Tuan Ngo
Public Health	Obed Odoemelum
Worker Safety and Fire Protection.....	Alvin Greenberg/Rick Tyler
Transmission Line Safety and Nuisance	Obed Odoemelum, Ph.D.
Hazardous Materials Management	Alvin Greenberg/Rick Tyler
Waste Management.....	Mike Ringer
Land Use	Jon Davidson
Traffic and Transportation.....	James Fore
Noise.....	Jim Buntin
Visual Resources	Michael Clayton
Cultural Resources	Gary Reinoehl/Roger Mason
Socioeconomic Resources	Amanda Stennick / Michael Fajans
Biological Resources.....	Noel Davis, Mike Foster, Rick York, Shari Koslowsky
Soil and Water Resources	Joe Crea / Dominique Brocard
.....	Jim Henneforth
Geology and Paleontology	Neal Mace
Facility Design.....	Brian Payne
Power Plant Reliability	James C. Henneforth
Power Plant Efficiency.....	James C. Henneforth

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